2007

PROCEEDINGS OF
TASSA ANNUAL CONFERENCE

March 23-25, 2007
YALE UNIVERSITY, NEW HAVEN, CT

Conference Theme

Essentials for a Better World: Energy, Environment, Food and Health

1526 18TH STREET, NW, WASHINGTON, D.C. 20036
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TASSA'08 will be held at Harvard Medical School in Boston, MA
on April 11-13, 2008.

Conference Theme
Innovation as Driver of Social Transformation and Economic Growth

Please start making your plans to attend the next TASSA Annual Conference. This conference will bring together prominent scientists and scholars from leading American and Turkish institutions as well as decision makers and potential partners.

TASSA VALUES YOUR PARTICIPATION AND
WISHES YOUR PRESENCE AT THE CONFERENCE

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FROM THE PRESIDENT AND CONFERENCE CHAIR

Dear TASSA Members and Conference Participants,

We would like to welcome you to the 2007 TASSA Annual Conference hosted by Yale University in New Haven, CT. We are certain that the conference program fulfills the expectations of our distinguished community and serves its theme "Essentials for a Better World: Energy, Environment, Food and Health." It showcases the accomplishments of many eminent American, Turkish, and Turkish-American scientists and scholars and establishes a forum for our young and experienced researchers to explore and develop new collaborative initiatives. The list of honorary guests and dignitaries is a meaningful tribute to the commitments of both the U.S. and Turkey for promoting scientific cooperation between the two countries.

We are most fortunate to have Prof. Cemal Kafadar and Prof. Daron Acemoglu address our audience as plenary speakers this year. Prof. Kafadar, Vehbi Koc Professor of Turkish Studies at Harvard University, History Department, is a world-renown scholar on Ottomon history. Prof. Acemoglu, Charles P. Kindleberger Professor of Applied Economics at Massachusetts Institute of Technology, is an internationally recognized expert in Economic Development and Political Economy.

Prominent scientists and scholars will participate in two panels, "Emerging Fronts in Energy, Environment, Food and Health" and "European Union and Turkey". Colleagues will discuss their views and present the state-of–the-art works on these most popular and important themes that stand to influence the prospects of future generations worldwide. This year, dedicated periods have been allocated for poster sessions. We also arranged our program so that the participants can have more time to interact and network with one another. We have planned for three interactive sessions where we intend to collectively search for solutions to enable and promote academic interactions between US and Turkey. In Panel II, "U.S. - Turkey Academic Networks - Individual Experiences", we will benefit from the experiences of our colleagues who have accomplished to establish such networks. Panel III, "U.S. – Turkey Academic Networks - Institutional Perspectives" will debate the role of decision makers and institutional policies for building successful bridges. The final panel of the program, "Turkey - US Innovation Partnership" will present and discuss Turkey's National Innovation Initiative as it impacts science and technology in Turkey within a global context. As always, we urge you to participate in "TASSA General Assembly and Interactive Session" and share your opinions to pave TASSA's future path.

A very special Reception Gala is organized for your enjoyment showcasing Yale University's spectacular and world-famous Peabody Natural History Museum. We are grateful to many organizations, institutions and individuals who shared TASSA's vision and chose to sponsor our activities. Without their generous support, this event would not have been possible. We express our gratitude also to the Council on Middle East Studies at the MacMillan Center for hosting our event at Yale University. Finally, our heartfelt thanks to Yale students, TASSA Board members, Conference Organizing Committee members and many other volunteers for spending countless hours to make this conference a reality.

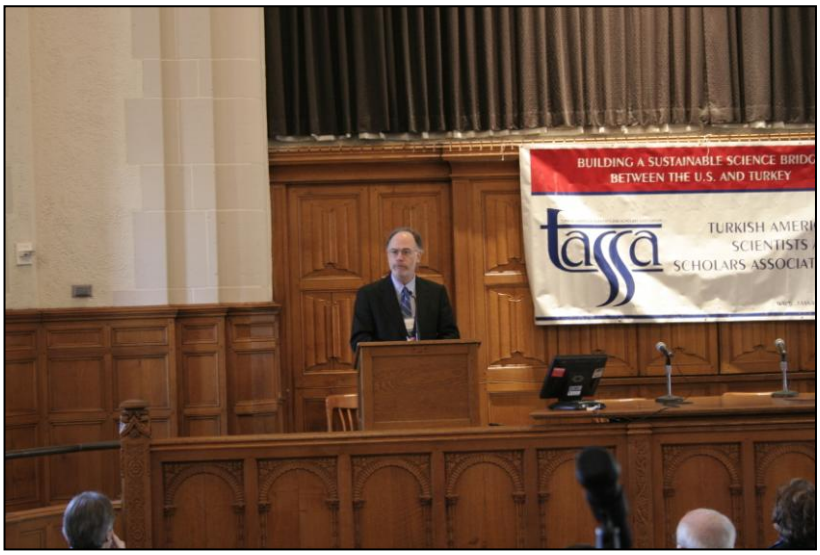
Thank you for coming to Yale University to share our excitement and pride.

Serap Aksoy
Conference Chair

Süleyman Gökoğlu
TASSA President

TASSA 2007 Annual Conference, Welcome Reception (from left): H.E. Ross Wilson, TASSA President Süleyman Gökoğlu, H.E. Nabi Şensoy, Conference Chair Serap Aksoy

TASSA 2007 Annual Conference, H.E. Nabi Şensoy



TASSA 2007 Annual Conference, H.E. Ross Wilson

TABLE OF CONTENTS

CONFERENCE PROGRAM

Friday, March 23, 2007

20:00 - 22:00	Welcome Reception (New Haven Lawn Club) 193 Whitney Avenue, New Haven, CT 06511

Saturday, March 24, 2007

7:30 - 18:30		Registration (Yale Law School)
7:30 - 8:30		Continental Breakfast (Yale Law School, Dining Hall)
8:30 - 9:00		Welcome and Introduction
		Süleyman Gökoğlu, President, TASSA Serap Aksoy, Conference Chair, Yale University Andrew Hamilton, Provost, Yale University
9:00 - 9:30		Honorary Speakers: Role of Turkey in the New Geopolitical Order
		H.E. Nabi Şensoy Turkish Ambassador to US H.E. Ross Wilson US Ambassador to Turkey
9:30 - 10:20		Plenary Speaker
		Cemal Kafadar Harvard University
	Introduced by:	Cemal Ekin Providence College
10:20 - 10:30		Presentation of Plaques to Diamond and Gold Sponsors
10:30 - 11:00		Coffee Break & Poster Viewing
11:00 - 12:30		Panel I: Emerging Fronts in Energy, Environment, Food and Health
	Moderator:	Selçuk Özgediz, World Bank
	Panelists:	John Rennie, Scientific American Magazine Mehmet Toner, Harvard Medical School Olcay Ünver[1], Kent State University Emre Seli[2], Yale University

[1] Couldn't attend due to a conflict in program
[2] Last minute substitute for Olcay Unver

12:30 - 13:30		Lunch (Yale Law School, Dining Hall)
13:30 - 15:00		Panel II: US - Turkey Academic Networks - Individual Experiences
	Moderator:	Yaman Yener, Northeastern University
	Panelists:	Hüseyin Güler, Scientific and Tech. Research Council of Turkey (TÜBİTAK) Dündar Kocaoğlu, Portland State University Yavuz Oruç, University of Maryland Candan Tamerler-Behar, Istanbul Technical University
15:00 - 15:30		Recognition of Young Scholars Travel Grant recipients Poster Session I (Coffee will be served)
15:30 - 17:00		Panel III: U.S. - Turkey Academic Networks - Institutional Perspectives
	Moderator:	Emin Kansu, Turkish Academy of Sciences (TUBA)
	Panelists:	Ahmet Ademoğlu, Scientific and Tech. Research Council of Turkey (TÜBİTAK) Adnan Akay, National Science Foundation (NSF) Tuncalp Özgen, The Council of Higher Education (YÖK)
17:00 - 17:15		Coffee Break
17:15 - 18:30		Panel IV: TASSA General Assembly and Interactive Session
	Moderator:	Süleyman Gökoğlu, President, TASSA
19:00 - 22:00		Reception & Dinner (Yale Peabody Natural History Museum)

Sunday, March 25, 2007

8:00 - 9:00		Breakfast (Yale Law School Dining Hall)
9:00 - 9:50		Plenary Speaker
		Daron Acemoğlu, Massachusetts Institute of Technology
	Introduced by:	Refik Soyer, George Washington University
9:50 - 10:00		Presentation of Plaques to Promoting and Sustaining Level Institutional Members
10:00 - 11:00		Poster Session II (coffee will be served)

11:00 - 13:00		Panel V: European Union and Turkey
	Moderator:	Şeyla Benhabib[3], Yale University
	Moderator:	David Cameron[4], Yale University
	Panelists:	Aslı Bâli[3], Yale Law School
		Halil Berktay, Sabanci University
		David Cameron, Yale University
		Türküler Işıksel, Yale University
13:00 - 14:00		Lunch (Yale Law School Dining Hall)
14:00 - 16:00		Panel VI: Turkey - US Innovation Partnership
		An Overview of National Innovation Initiative
		Cemil Arikan, National Innovation Initiative, Turkey & Sabanci University
	Moderator:	Cemil Arikan, National Innovation Initiative, Turkey & Sabanci University
	Panelists:	Oğuz Babüroğlu, Turkish American Business Council (TAIK) & Sabanci University
		Nilüfer Eğrican, Yeditepe University
		Müge Tanik, Intel Corporation
16:00		Closing Remarks
		Süleyman Gökoğlu, President, TASSA
		Serap Aksoy, Conference Chair, Yale University

[3] Couldn't attend due to conflict in program

[4] Last minute substitute for Şeyla Benhabib

FROM AMBASSADOR NABİ ŞENSOY

It is a great pleasure for me to welcome the participants of the 3rd Annual TASSA Conference at Yale University entitled "Essentials for a Better World: Energy, Environment, Food and Health".

We are living in a changing global environment in which we are seeking ways to overcome new challenges. Science is the only means to achieve the objective of clean and efficient energy, preservation of our environment and the adequate global supply of nourishment as well as the provision of health to our societies. And, scholarship is the indispensable element of furthering human civilization.

In the theme of this conference I find both the reflection of a mindset that cares about the present and future of our planet and the heartening voice of the learned Turkish-American community to work for a better world through science and scholarship.

Turkey and the United States enjoy excellent relations anchored in shared values and a strategic partnership. They cooperate on a wide range of issues. The Shared Vision document made public last year, demonstrates the breadth of the common agenda and the mutual will to pursue them further. As the Turkish Ambassador, I have made it a priority to advance Turkish-American cooperation also in the field of science and technology.

Interaction between the Turkish and American scientific communities and peoples is one of our main assets to further improve bilateral ties between our countries. Cooperation in the field of science and technology should be a salient feature of our relations. To reach this aim, we will also need the enthusiasm and dedication of the scientists and scholars of both countries. I thank the leaders and members of TASSA for sharing this vision.

Finally, I would like to take this opportunity to commend the distinguished members of the Turkish-American scientific community as well as the leadership of TASSA for their efforts and wish them a successful Conference.

H.E. Nabi Şensoy
Ambassador of the Republic of Turkey to the United States

FROM AMBASSADOR ROSS WILSON

Welcome to the third annual conference of the Turkish American Scientists and Scholar Association, which will tackle the worthy theme of "Essentials for a Better World: Energy, Environment, Food and Health."

As American Ambassador to Turkey, I am working with the government and others to revitalize and modernize a partnership that has served the interests of our two countries well over sixty years. On March 12, 1947, President Truman laid out a new U.S. vision for peace and stability in Europe that we refer to today as the Truman Doctrine. The President proposed $400 million in aid for Turkey and Greece. Congress supported the call for aid to Turkey and for broader funding under the Marshall Plan that was proposed in June 1947. Our post World War II relationship with this country was established.

We remain committed to that relationship and, indeed, our alliance. Last July, when he visited the United States, Foreign Minister Gul and Secretary of State Rice announced a Shared Vision and Structured Dialogue in which our countries pledged to improve cooperation on a wide range of issues. Among the areas our leaders identified were education, science and technology.

This conference is a very useful opportunity to assess our work in these areas and identify new opportunities. I applaud TASSA's important contributions to promoting collaboration and partnership and wish great success for this conference.

H.E. Ross Wilson
Ambassador of the United States to the Republic of Turkey

time for another howl:
I saw the best minds of my generation...

Cemal Kafadar
Harvard University

Cemal Kafadar is Vehbi Koc Professor of Turkish Studies at Harvard University, History Department. He was director of the Center for Middle East Studies from 1999 to 2004. His study of early Ottoman history, Between Two Worlds: The Construction of the Ottoman State, has been translated into Arabic, Greek and Turkish (all of them forthcoming).

Ever in search of hidden troves in archives and libraries, his discoveries there have led to works on autobiographical writing and to the editing of a Sufi lady's mid-17th century dream log (Asiye Hatun'un Ruya Defteri, 1640, Oglak Yayinlari). He is also pursuing his interest in the narratives of modernity and tradition through research projects related to Ottoman social and cultural life in the early modern era. Since 1990, he has been managing a gorup project to digitize the court records of Ottoman Istanbul; the first volume in that series is just published (by Sabanci University Press), and more than twenty others are in the pipeline.

He plans to publish a book on one of his central concerns, the politics of crowds and rebellions in Istanbul from the late 16th to the early 19th centuries. Meanwhile, his essays and lectures on the topic will appear in "Rebels without a cause? Janissaries and other Riffraff of Ottoman Istanbul" (Bilgi University Press, forthcoming). He continues to work on related topics, including the history of coffeehouses, uses of the night, and communities of dissent.

Disease and Economic Development

Daron Acemoğlu
Massachusetts Institute of Technology

Daron Acemoglu presented his joint work with Simon Johnson. Their study aimed to find out the relationship between health and economic development. They addressed questions such as how this relationship depends on population, or whether differences in health conditions and disease environments (e.g. tropics) a major cause of today's large gap in income per capita. The emerging consensus is that disease burden is a big barrier to economic growth, as in Africa. Investing in health is an excellent social policy goal for humanitarian reasons, but there is no strong evidence that this investment will foster significant economic growth and close the income gap between rich and poor countries.

Dr. Acemoglu first presented data that support well-established, positive, cross-country correlations between measures of health (e.g., life expectancy) and income per capita. Next, he analyzed the international epidemiological transition of 1940s and 1950s that happened with the invention of new drugs (antibiotics), vaccines (yellow fever) and chemicals (DDT). The extension of public health programs to high mortality areas of the world during and after World War II, and successful campaigns against malaria in Asia and Americas, and spread of immunization and antibiotics in LDCs helped the transition. Therefore, in 1940s and 1950s, many improvements in health were observed in Latin America, South Asia and Eastern Europe. Consequently, the developing countries in 1960s and today are much healthier than Western Europe at a comparable stage of development: life expectancy in India in 1999 was around 60, while the life expectancy in Britain in 1820 was about 40. An important aspect to note is that interventions are improving overall health and morbidity, not just mortality.

Dr. Acemoglu went on to summarize theoretical discussions on the effects of better health in the medium and long runs. He established a simple mathematical framework and discussed how to interpret the estimates of his formulation after explaining the details of interventions and the nature of each major epidemic (malaria, cholera, dysentery, etc.).

Finally, Dr. Acemoglu emphasized that global interventions from 1940 had beneficial effects on health and life expectancy, and that this has been a big success on humanitarian grounds. However, there's no evidence that the increase in life expectancy driven by exogenous factors had led to an increase in per capita income. Improvements in life expectancy have caused an increase in population, and some increase in overall output, but the net effect is far from an increase in income per capita.

About Daron Acemoğlu

Daron Acemoğlu is currently Professor of Applied Economics at Massachusetts Institute of Technology. He is the winner of the 2005 John Bates Clark Medal, and became elected fellow to American Academy of Arts and Sciences in 2006.

Acemoglu graduated in 1986 from the Galatasaray High School in Istanbul. He got his B.A. at the University of York, UK and his master's degree in mathematical economics and econometrics and then his doctorate in 1992 at the London School of Economics. He was a lecturer in economics at the London School from 1992-1993. Acemoglu became a member of the M.I.T. faculty in 1993. He was promoted to full professor in 2000, and was named the Charles P. Kindleberger Professor of Applied Economics in 2004. He is a member of the Economic Growth program of the Canadian Institute of Advanced Research. He is also affiliated with the National Bureau of Economic Research, Center for Economic Performance, and Center for Economic Policy Research.

His principal interests are Political Economy, Economic Development, Economic Growth, Technology, Income and Wage Inequality, Human Capital and Training, and Labour Economics. His most recent works concentrate on the role of Institution in Economic Development and Political Economy. Daron Acemoglu is also the co-editor of the Review of Economics and Statistics, and associate editor of the Journal of Economic Growth.

Daron Acemoğlu during a press interview

PANEL I
Emerging Fronts in Energy, Environment, Food and Health

The Panel examined the challenges and opportunities facing the scientific community in the areas of energy, environment, food and health. It also opened a few windows to the work of individual scientists to illustrate how they are addressing challenges in the emerging fronts of science.

In his opening remarks **Selçuk Özgediz**[5], moderator of the Panel, told the story of the scientists' battle against wheat stem rust, a fungal disease, discovered in Uganda in 1999 (thus called Ug99). The disease spread by wind, people, animals, etc., first to Kenya and Ethiopia, causing major drops in wheat yields. It has recently been discovered across the sea in Yemen and is poised to threaten major wheat growing areas of the world (especially India and Pakistan), where poverty rates are high. Ozgediz described how scientists were able quickly organize a global initiative to build durable resistance to Ug99. The threat still exists, but the effort to find a solution to help wheat farmers with the disease also continues at full speed. Ozgediz described the scientists' work in this case as a "race against time" to avoid major crop losses and possible a possible famine situation and underscored the importance of maintaining collections of plant germplasm and dialogue among scientists through global and regional networks.

John Rennie[6] spoke next. He discussed how the world's future over the next half century and beyond will be ruled by three immensely important, interlocked transitions. *First*, with global population expected to stabilize by mid-century at around 9.5 billion, the global population will experience a huge ***demographic transition***, with the number of older and urban people more than counterbalancing the young and the rural. *Second*, because of global warming concerns and uncertainties about the steady availability of cheap oil for fuel, the world faces a rather urgent need to develop and disseminate ***new energy technologies***. This will be especially important for poor countries, where efficient economic development is a humanitarian issue. *Third,* ***nutritional issues*** will crystallize in several important ways. One is that we will need to improve agricultural yields affordably to feed the larger population (which will be supported by fewer farmers.) But, also, the developing world will need to simultaneously deal with issues of ***malnutrition*** and ***obesity***, as traditional cultural diets crumble and vastly larger populations suddenly find themselves at risk of "problems of affluence," like diabetes.

Mehmet Toner[7] followed. He focused on the territory where engineering meets medicine. More specifically, he illustrated the impact of multidisciplinary research in cancer diagnosis, global health, tissue engineering, and systems biology. Toner gave several examples from his current research on microsystems engineering and micro- and nano-systems in biology.

Emre Seli[8] was the last speaker in Panel 1. He provided another example of multidisciplinary research, where scientists from different backgrounds come together and lead the development of a much needed technology that may be useful in treatment of infertility as well as in other medical fields. The specific technology he illustrated was ***metabolomics*** as a new tool for embryo assessment.

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[5] Senior Consultant, Consultative Group on International Agricultural Research, the World Bank.

[6] Editor in Chief, *Scientific American*.

[7] Professor of Surgery and Biomedical Engineering, Harvard Medical School.

[8] Assistant Professor of Obstetrics, Gynecology and Reproductive Sciences, Yale University, School of Medicine.

Panel I, Selçuk Özgediz is giving his opening remarks

PANEL II
US – Turkey Academic Networks – Individual Experiences

The Panel examined the challenges and opportunities facing the scientific community in promoting academic interactions between the U.S. and Turkey. The audience benefited from the experiences of colleagues who have accomplished to establish such networks.

Panel II, Aziz Uluğ is introducing the panelists

PANEL III
US – Turkey Academic Networks – Institutional Perspectives

The panel examined the issue of academic networks between US and Turkey from an institutional perspective. It was moderated by Emin Kansu from Turkish Academy of Sciences (TÜBA) and brought together representatives of scientific policy maker institutions from both US and Turkey.

Hacettepe University Rector and member of Turkish Higher Education Council (YÖK) Prof. Dr. Tuncalp Özgen described the structure of YÖK in Turkey. He explained YÖK's duties and responsibilities and the importance of coordination that YÖK provides among universities in Turkey. He reported on the YÖK's strategy plan which was prepared in 2006 and explained the changes that this plan brings to higher education in Turkey.

National Science Foundation (NSF) Civil, Mechanical and Manufacturing Innovation Division Director, Prof. Dr. Adnan Akay explained the fundamental structure of NSF and an overview of budget planning. Dr. Akay pointed out that that until 2002, Turkey spent only %0.67 of gross national income on Research and Development whereas in Sweden it was %3.76. Dr. Akay further gave statistics about master and PhD level graduates in US. He discussed how important it is for NSF to create infrastructure and thus manage human resources, administration and budget.

Dr. Akay also mentioned collaborations between NSF and Turkish universities. Recent examples included collaborations between State University of New York (SUNY) and several Turkish Universities and between Montana State University and İstanbul Technical University (İTÜ).

The Scientific and Technological Research Council of Turkey (TÜBİTAK) science council member Prof. Dr. Ahmet Ademoğlu explained the evolution of Turkish Science and Technology System from 1960s. Dr. Ademoğlu reported on the Academic R&D Grants of TÜBİTAK. He further discussed the cooperations with ESF (European Science Foundation), EMBO (European Molecular Biology Organization) and participation in European 7th Framework.

PANEL IV
TASSA General Assembly and Interactive Session

The Executive Committee of TASSA hereby presents to the membership for its approval a summary of TASSA programs and activities in 2006. The report covers the period starting from January 1, 2006, until December 31, 2006. The programs and activities listed below are not in any order of priority, nor are they necessarily given chronologically. Though they constitute a tangible list of potential landmark activities and major accomplishments, there had been many other invisible efforts and unmentioned groundwork behind the scenes which earned TASSA the reputation it deserves today. During the brief period of its existence, TASSA has been gaining the respect of many reputable institutions for science and technology (S&T) and for policy-making, both in North America and across the Atlantic. Currently, TASSA is being recognized by many people as an organization that undertakes new initiatives, that undersigns ground-breaking activities, and that establishes first-ever connections and joint collaborations. Many of the activities listed below represent only the initial seeds of a thriving organization aiming towards a more productive future with fruitful results.

U.S. – Turkey Science Bridge: In accordance with its vision to build sustainable science bridges between the U.S. and Turkey, TASSA has undertaken and been involved in the following list of activities in 2006:

- TASSA has been instrumental in arranging an official visit of TÜBİTAK, the Scientific and Technological Research Council of Turkey, to the U.S. by providing a significant platform at the TASSA Annual Conference in Philadelphia in March. TASSA has also helped TÜBİTAK to connect with key S&T organizations in the U.S. to facilitate their meetings in Washington, DC, the week after the Annual Conference.
- In May, TASSA played a key and active role in arranging a visit to Turkey by Dr. George Atkinson, the Science and Technology Adviser to the U.S. Secretary of State. Dr. Atkinson started his trip first by joining the TASSA- TÜBİTAK workshop held at TÜSSİDE in Gebze and by addressing the participants in the opening session. During his four-day trip, officially hosted by TÜBİTAK, Dr. Atkinson toured the facilities at TÜBİTAK Marmara Research Center, visited a few state and private universities both in Istanbul and Ankara, met with some TUSİAD members, and conferred with U.S. Ambassador Ross Wilson. TASSA President Süleyman Gökoğlu accompanied him throughout his stay in Turkey.
- In July, a Shared Vision document was put into effect between the U.S. and Turkey to advance their strategic partnership. TASSA claims significant credit for the special emphasis in this document on S&T collaboration, and on the promotion of bilateral exchanges among scientists and engineers, academicians and think-tanks, and educators and students.
- In September, the Supreme Council of Science and Technology in Turkey held its 14th meeting in which the TASSA- TÜBİTAK workshops and Dr. Atkinson's visit to Turkey were among the highlights of international cooperation activities in S&T between the Turkey and the U.S. Major decisions were

made requiring improvements in Turkey's science and technology, and innovation capacity, and developing and fostering existing networks and linkages, such as those with TASSA. The Council also recognized the need to have a S&T Attaché appointed to key embassies abroad, a measure actively promoted by TASSA and supported by the Turkish Embassy in Washington.

• TASSA is proud to have done its own share of contributions in the publication of a 19-page Special Section, TURKEY THE BRIDGE in the January 2007 edition of the Scientific American magazine.

Governance: A special online TASSA General Assembly was held in January 2006 at which a new amended Bylaws (version 6.0) was approved by the membership. The new Bylaws brought some changes to the structure of the Board of Directors (BoD). The BoD had gone through a transitional period of adjustment with the new Bylaws until the special elections were held at the end of 2006.

Special elections were held in late 2006 which renewed a portion of the Technical Groups on the BoD. The newly elected members of the Board have started their terms effective January 1st, 2007. Banu Onaral is the newly elected President-Elect of TASSA. Dr. Onaral is the H. H. Sun Professor of Biomedical Engineering and Electrical Engineering, and Director of School of Biomedical Engineering, Science and Health Systems at Drexel University. She will begin her two-year term of presidency on January 1st, 2008.

During the second half of 2006, Executive Director Levent Yanık and Finance Director Altan Turgut had to leave their positions in the Executive Committee. Murat Tukel was appointed as the new Executive Director in December 2006 and Refik Soyer was elected as the new Treasurer during the recent elections.

The new Bylaws eliminated the former status of the Web Committee as a standing committee with an intention to expand its responsibilities as well as providing more flexibility to its structure in the ever-changing environment in the information technology world. Towards this end, the BoD developed a protocol defining the structure and charter of a committee named the Information Technology Committee (ITC) and formally established the ITC. Yalçın Sert was appointed to chair this committee.

During 2006, the BoD conferred two new people as honorary members of TASSA. We are proud to add Gazi Yaşargil and Aziz Sancar in our roster of honorary members.

Annual Conference: TASSA held its second Annual Conference at Drexel University in Philadelphia, PA, on March 25-26, 2006. More than 300 prominent scientists and scholars attended the meeting. About ninety posters were accepted and more than sixty of them were presented at the conference. As a vehicle to help young scholars to participate in major TASSA events, TASSA established a mechanism under the title of Young Scientists Grant and supported a total of 11 people for their conference-related travel expenses. The proceedings were published in hardcopy and are also electronically posted on our Web site. As soon as the BoD reached a decision in October 2006 to hold the third Annual Conference at Yale University in New Haven, CT, on March 24-25, 2007, an official conference organizing committee was established.

Visiting Scholars Program (VSP): TASSA launched this new initiative with an aim to promote cooperation between its members in the U.S. and their counterparts in Turkey. The program provides no-cost opportunities to the Turkish educational and research institutions to host U.S. scholars visiting Turkey, typically using their own resources. TASSA has developed a database of potential host institutions in Turkey with more than 1,000 entries. During the second year of its establishment, there have been about 30 applications to the VSP and the program received very positive feedback from its participants.

TASSA- TÜBİTAK Workshops (TASTUB): A compact was established last year between TASSA and TÜBİTAK to foster research collaborations between the scientists from the U.S. and Turkey. The program continued with the second workshop held in Gebze, Turkey, in May 2006. A total of about 100 researchers (20% from the U.S., 30% from universities in Turkey, and 50% from TÜBİTAK Marmara Research Center) joined the workshop, doubling the number of participants from the U.S. from 10 in last year to 20 this time. Two new theme areas, namely, food & nutritional sciences and technology management, were added to the former five different themes of the previous year which covered the areas of nanotechnology, biotechnology, energy, environmental sciences, and earth sciences/natural disasters. Some of the produced joint project ideas have now been matured and turned into formal proposals and are being submitted to TÜBİTAK for funding. TASSA has requested from TÜBİTAK an assessment report about the achievements of the past two workshops. Currently, TASSA is considering more specific workshops on more focused areas, such as bio-nanotechnology.

Regional Workshops: Towards its objective to hold regional workshops under various themes and in accordance with a protocol developed to organize such workshops as a mainstream TASSA activity, TASSA held the first TASSA- TUSİAD regional meeting in Boston in June 2007. This event brought scientists and scholars in the region together with the applied research and business teams from various prominent companies. TASSA forges alliances with other organizations that foster similar or overlapping missions. Along these lines, TASSA was a proud sponsor of TABCON 2006 organized in May by the Turkish American Business Connection Association in Berkeley, CA.

Membership: The number of people who voluntarily registered to TASSA through its online system has reached 1900 at the end of December 2006. However, only about 20% of them were dues-paying members, making it an area requiring immediate attention and improvement. As the amended Bylaws cleared its pathway, TASSA has established a new membership category: Institutional Members.

We urge you to get more actively involved in TASSA programs and activities, and to support our flourishing organization.

Respectfully,
Süleyman Gökoğlu, Ph.D.
President, TASSA

PANEL V
European Union and Turkey

Membership in the European Union (EU) has had high visibility and priority for the recent governmental policies in Turkey. The panel participants presented papers on the social implications of the membership with a historical perspective on Turkish-European relations. Participants of the panel were in agreement that Turkey's candidacy process had entered a crucial phase owing to recent developments including the upcoming parliamentary and presidential elections in Turkey, rising anti-Turkish rhetoric among European heads of government, and the renewed standoff over Cyprus.

Prof. Berktay and Ms. Isiksel raised respective notes of caution against the rising wave of ultra-nationalism in Turkey which they viewed as threatening the recently enacted democratic and human rights related reforms. In his erudite and inspiring historical perspective into the roots of Turkish ethnic nationalism, Berktay explored the ambivalences inherent in Turkey's relations with "the West", of which he described the current EU candidacy process as an episode. Isiksel argued that the intelligent strategy for riding out the rising wave of national isolationism in Turkey should be to advocate the unique benefits of full EU membership so as to recapture the support of the vast majority of the electorate who once lent their support to the membership idea, and to raise awareness of the exact changes required to complete the candidacy process in order to counter ill-intentioned efforts at misleading the public.

Prof. Cameron approached the issue from the perspective of the European Union as a complex institutional actor, emphasizing the heterogeneity of its foreign policy voice and the inevitability of inconsistencies in its relations with candidate countries. He also drew attention to the peculiar challenges Turkish membership poses to the EU's institutional set-up, emphasizing the difficulty for any country, not least one of Turkey's size, of adjusting to half a century's worth of European legislation.

David Cameron, Professor of Political Science and the Director of Undergraduate Studies, Yale University
Halil Berktay, Faculty of Arts and Social Sciences, Sabanci University
Türküler Işıksel, PhD Candidate in Political Science, Yale University

PANEL VI
Turkey – US Innovation Partnership

The National Innovation Initiative (NII) has been established in June 2005 to improve the current innovation process in Turkey. NII's main goal is to mobilize a civil movement that can strengthen the collaboration between the private sector, universities and Non-government Organizations (NGO's) towards developing innovation policies; start or improve communication between the political authorities and the industry; prepare reports and recommendations, and support building public awareness on innovation.

NII has started its activities with 21 Founding Members from business community, universities and NGOs; and has established five Working Groups composed of 109 distinguished members from academia, business community and from NGOs. The Working Groups are:

1. Turkey and Innovation in 2023,
2. Financing of Innovation,
3. Human Resources and knowledge for Innovation,
4. Environment and Infrastructure, and
5. Innovation in the Public Sector.

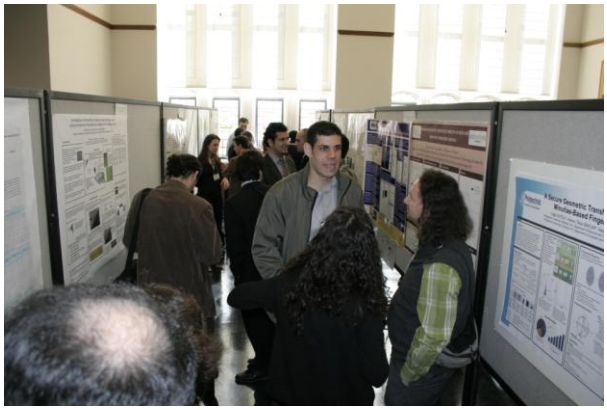
The priority of these Working Groups is to prepare a comprehensive "Innovation Framework Report" in their areas of interests with short and medium term proposals and projects.

NII aims to investigate the possibilities of reinforcing our existing strengths, ensuring better evaluating existing opportunities and define weaknesses, and ensuring that the existing threats are transformed into opportunities. It is expected that NII will make substantial contribution to the innovation initiatives which will play an active role in the progress in social as well as in economic arena in Turkey; hence improving the level of prosperity. A "Panel of Global Consultation" has been established with 6 distinguished individuals from different parts of the world with vast experience in innovation from different perspectives. Their recommendation has been included in this report.

NII assumes that all science, technology and innovation related policies are approved by the Supreme Council of Science and Technology of Turkey and these policies will be implemented rapidly. Hence, the objective of the initiative is to develop concrete and viable recommendations on areas that require improvement towards successful implementation of mentioned policies.

The intent of NII is to provide added value to Turkish society by cultivating a culture of innovativeness, creativity and the entrepreneurial spirit across all socio-economic layers and age groups.

POSTER ABSTRACTS



Novel Thermal Barrier Coatings (TBCs) Resistant to CaO-MgO-Al_2O_3-SiO_2 (CMAS) Glassy Deposits

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Higher performance and durability requirements of gas-turbine engines will require a new generation of thermal barrier coatings (TBCs). This is particularly true of engines operated at higher temperatures, where TBCs are subjected to attack by CaO-MgO-Al_2O_3-SiO_2 (CMAS) glassy deposits. In this context, a new processing method — solution precursor plasma spray (SPPS) — has been used to deposit a new generation of TBCs. The SPPS method, where the deposition occurs by rapid pyrolysis and solidification, is capable of producing TBC top-coats of metastable ceramics with extended solid solubilities. These metastable-ceramics top-coats can serve as chemical-species reservoirs, which assist in the mitigation of CMAS-degradation of TBCs. In this study, CMAS interactions with SPPS TBCs of various metastable compositions are compared with reference conventional TBCs deposited by air plasma spray (APS). It has been found that the new metastable SPPS TBCs of Y_2O_3-stablized ZrO_2 with Al and Ti addition are highly resistant to CMAS attack. In this talk, results from characterization and testing of these new TBCs will be presented, together with a discussion of mechanisms responsible for the CMAS-attack mitigation.

Improvements on the Detectability of Glucose from Spectroscopic Signals

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Frequent measurement of blood glucose is crucial for diabetic patients in managing the glucose level and thus reducing the severe complications associated with the disease. A potential non-invasive measurement technique could be a painless alternative to the current finger pricking method. Raman spectroscopy is a technique that employs the scattering of a frequency-shifted optical signal and it is one of the proposed non-invasive techniques determining the glucose concentration of blood by acquiring the spectrum from the optically accessible anterior chamber (AC) of eye. The aqueous humor (AH) filling the AC is a good site for glucose measurements. In this study, we used a relatively inexpensive, compact and portable Raman system which can be made sufficiently affordable and convenient for patient use. One concern of using AH to measure the blood glucose is the low glucose concentration in AH. In order to improve the detectability of the low glucose concentration from Raman spectra, we applied two well-known linear transformation methods in a consecutive manner to the collected spectral data. Experimental results show that our proposed method provides a simple yet practical way to improve the detectability of the glucose from the Raman signal.

Hydrodynamics of Trickle Bed Reactors at Elevated Temperature and Pressure for Newtonian/non-Newtonian Liquids – Steady and Unsteady Operation

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Trickle bed reactors find widespread usage in industry especially under elevated temperature and pressure and where sometimes non-Newtonian liquids are being involved. Trickle bed industrial applications are legion in petrochemical, (bio)chemical and waste treatment processes. Most of the academic work on trickle bed hydrodynamics was concerned with trickle flow regime, sometimes at elevated pressure; but scarcely under elevated temperature. Among the most important parameters for reactor design is the liquid holdup, especially for operation in the high interaction regimes, such as pulse flow, at high temperature and pressure, sometimes with non-Newtonian liquids. It is the proposition of this study to shed some light on these operational aspects regarding liquid holdup at pulsing flow for Newtonian (air-water) and non-Newtonian (air-0.5% w/w carboxymethylcellulose (CMC)) fluids with non-porous spherical (glass beads) particles. Non-steady operation of trickle bed reactor (TBR) is advocated for the amelioration of reactor behaviour, e.g., efficiency increase and hot spot control. To the best of our knowledge, except some recent published work on the induced pulsing flow characteristics carried out at atmospheric pressure and ambient temperature, there is no information available in the literature about the induced pulsing flow characteristics at elevated pressure and/or temperature. Furthermore, as industrial TBR applications also concern some biochemical processes, the effects of pressure and eventually temperature ought to be investigated for non-steady operation with non-Newtonian liquids.

Effect of Plasma Treatment on the Attachment and Proliferation of Osteoblasts on Poly (ε-caprolactone) Scaffolds

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Tissue engineering of bone is increasingly becoming the treatment of choice among surgeons to alleviate graft rejection, donor site morbidity and disease transmission problems. Favorable cell-substrate interaction during early stage of the cell seeding is one of the most desirable features of tissue engineering. The ability of bone cells to produce an osteoid matrix on the scaffold can be affected by the quality of the cell-scaffold interaction. In this paper we report the use of dielectric barrier dischange plasma to improve adhesion and proliferation of osteoblasts on poly (ε-caprolactone) (PCL) scafffolds. The surface treatment was carried out on PCL films at atmospheric pressure using a custom made oxygen-based di-electric barrier discharge system (DBD). The effects of plasma treatment on PCL surface were characterized by assessing surface energy, surface topography, and surface chemistry. The modified and unmodified PCL films were evaluated for their solid surface energy by measuring the contact angles of apolar and polar probe liquids using the Owens-Wendt's model. The surface topography was evaluated by Atomic Force Miscroscopy (AFM). The cell-sustrate interaction study was carried out using mouse osteoblastic cell line 7F2 to examine the effect of oxygen plasma. Our results suggested that the oxygen plasma treatment not only enhances the hydrophilicity and increases solid surface energy and roughness of PCL but also improves the initial attachment, proliferation and migration of osteoblasts on the PCL substrate.

Automated Simple Moving Object Activity Recognition From Video Sequences

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In recent years, safety and security concerns have led to a considerable increase in video surveillance and monitoring research efforts. These have found many military and civilian applications such as monitoring of banks, parking areas, buildings, department stores, and national borders. Most of the current monitoring systems use multiple cameras and human operators to detect unexpected scenarios, because in realistic applications it is difficult to tract moving objects over a long time period. There exists considerable need for automatic scenario recognition system. There are two main parts in scenario recognition: (a) Low level processing, including background model generation, moving object detection, illumination removal, object tracking and back-ground/ template updating, resulting in the generation of a vector of features that abstracts the scenario. (b) High Level Processing, which uses the features to perform event classification and scenario recognition. A new approach, based on control chart, is developed for the task of recognition of events and scenarios in video image sequences. For each image in the sequence, low level image processing and feature extraction steps result in feature descriptors for objects of interest detected in the images. Control chart analysis is then performed to classify the nature of the activity depicted by the temporal changes in these features over the image sequence. Scenario recognition is achieved with higher accuracy using the simple approach compared to Artificial Neural Network, Naïve Bayes Classifier, Decision Tree and Hidden Markov Models.

Robust Non-Blind Video Watermarking In Frequency Domains

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Protection of digital multimedia content has become an increasingly important issue for content owners and service providers. Watermarking is the process of embedding data into a multimedia element such as image, audio, or video. The embedded data can later be extracted from, or detected in, the multimedia for security purposes. Due to large amount of frames, similarity between frames and temporal attacks (frame dropping, frame averaging, frame swapping etc.), video watermarking process is more difficult than image watermarking. Current image watermarking methods are not adequate to solve these difficulties. We propose a novel video watermarking system based on Hidden Markov Model (HMM) and Artificial Neural Network (ANN). The proposed watermarking scheme splits the video sequences into Group of Pictures (GOP) with HMM. Portions of the binary watermark will be embedded into each GOP with a selected transformation domain watermarking algorithm. For each GOP, ANN produces the optimal transformation algorithm. The embedding process is the standard additive algorithm in low and high frequencies in different transformation domains. This novel system increases the robustness against geometric and temporal attacks, and increases the quality of the watermarked video.

Implementation of Automated Diagnostic Systems for Biomedical Signals

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The paper includes illustrative and detailed information about implementation of automated diagnostic systems and feature extraction/selection from biomedical signals. The major objective of the paper is to be a guide for the readers, who want to develop an automated diagnostic system for detection of disorders. Toward achieving this objective, this paper presents the techniques which should be considered in developing automated diagnostic systems. The author suggests that the content of the paper will assist to the people in gaining a better understanding of the techniques in the detection of disorders.

Automated diagnostic systems are important applications of pattern recognition, aiming at assisting doctors in making diagnostic decisions. Automated diagnostic systems have been applied to and are of interest for a variety of medical data, such as ECGs, EEGs, ultrasound signals/images, X-rays, and computed tomographic images. Conventional methods of monitoring and diagnosing the diseases rely on detecting the presence of particular signal features by a human observer. Due to large number of patients in intensive care units and the need for continuous observation of such conditions, several techniques for automated diagnostic systems have been developed in the past ten years to attempt to solve this problem. Such techniques work by transforming the mostly qualitative diagnostic criteria into a more objective quantitative signal feature classification problem.

Medical diagnostic decision support systems have become an established component of medical technology. The main concept of the medical technology is an inductive engine that learns the decision characteristics of the diseases and can then be used to diagnose future patients with uncertain disease states. A number of quantitative models including multilayer perceptron neural networks (MLPNNs), combined neural networks (CNNs), mixture of experts (MEs), modified mixture of experts (MMEs), probabilistic neural networks (PNNs), recurrent neural networks (RNNs), and support vector machines (SVMs) are being used in medical diagnostic support systems to assist human decision-makers in disease diagnosis. Artificial neural networks (ANNs) have been used in a great number of medical diagnostic decision support system applications because of the belief that they have greater predictive power. Unfortunately, there is no theory available to guide an intelligent choice of model based on the complexity of the diagnostic task. In most situations, developers are simply picking a single model that yields satisfactory results, or they are benchmarking a small subset of models with cross validation estimates on test sets.

On analyzing recent developments, it becomes clear that the trend is to develop new methods for computer decision-making in medicine and to evaluate critically these methods in clinical practice. Diagnosis of diseases may be considered as a pattern classification task. If the inputs are ambiguous and possess variability, the conventional pattern classification system may not work. As in traditional pattern recognition systems, the present model consists of three main modules: a feature extractor that generates a feature vector from the raw biomedical signals, feature selection that composes diverse and composite features (the model-based power spectral density values, the eigenvector power spectral density values, wavelet coefficients), and a feature classifier that outputs the class based on the diverse and composite features.

Investigation of Topographic Amplification in Granular Steep Slopes with Centrifuge Modeling Technique

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It is widely recognized that the amplitude and frequency content of strong ground motion can vary across slopes, ridges, and canyons. This phenomenon, known as topographic effects, can result in damage concentrations near the crests of slopes. The contribution of topographic effects to the overall ground amplification and seismic hazards has never been studied by physical modelling tools. In this study, the centrifuge test was conducted to find individual contributions of surface topography and subsurface conditions to ground motions' amplification in frequency domain. The centrifuge model was intended to simulate a 10.5 m high prototype sand embankment (Dr=50%) overlying a 4.5 m foundation layer consisting of dense sand (Dr =80%). The side slopes of the model were inclined at 30 degrees and 25 degrees, and both the embankment and the foundation layer were unsaturated. Model slope was subjected to a suite of ground motions including synthetic (frequency sweeps) and recorded earthquake motions with varied frequency content, duration and amplitude. The centrifuge test's results was employed to investigate the effects of topographic amplification in the granular model slopes with different slope angles over small to large strains
This study shows that peak topographic response ranges over normalized frequencies of 0.2 to 0.45, while peak response is largely centered at approximately 0.2 for the larger amplitude test motions. Overall dynamic response of the embankment was largely governed by site effects, particularly at its resonate frequency of approximately 5.5 Hz. Finally, this study demonstrates the viability of owing physical modelling for studying site and topographic effects in earth structures and systems.

Improving Labor Productivity Rates for Nuclear Power Plant Construction

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Productivity is a measure of economic efficiency that shows how well economic inputs are converted into outputs. Increase in productivity, which is the ability to produce more with the same or less input, is a major source of increased potential income. Labor productivity is the most commonly used productivity measure. Labor is an easily identified input to virtually every production process. In this paper, we will discuss some of the methods for improving labor productivity rates for nuclear power plants which are special structures. Immersive Projection Display (IPD) technology will be discussed as a tool for the application of these methods to improve schedules and reduce both construction and maintenance costs.

Building Information Modeling Application for Environmental Impact Statement (BIMAFEIS). A Case Study: Ridge Hill Village

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Definition of Environmental Impact Statement (EIS) is given as "A detailed statement which, to the fullest extent possible, identifies and analyses, among other things, the anticipated environmental impact of a proposed action and discusses how the adverse effects will be mitigated. (Source: LANDY)" by Environmental Protection Agency. The National BIM Standard (NBIMS) defines Building Information Modeling (BIM) as a digital representation of physical and functional characteristics of a facility. In this paper, a new model called Building Information Modeling Application for Environmental Impact Statement (BIMAFEIS) is defined. The intention of BIMAFEIS model is to fully integrate EIS to BIM. By integrating EIS to BIM there will be considerable amount of time saving during Draft and Final stages of EIS and public hearings. Ridge Hill Village project developed by Forest City Ratner Companies (FCRC) is presented as a case study. The advantages that could be gained by using BIMAFEIS model in Ridge Hill Project will also be discussed in this paper.

Formation of Graphene Sheets and Carbon Nanotubes on SiC

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We studied the carbon formation on single crystalline 6H SiC by vacuum decomposition at 1200-2000 °C. Produced nanostuctures were characterized by using scanning electron microscopy (SEM), transmission electron microscopy (TEM), atomic force microscopy (AFM) and Raman spectroscopy. Our studies show that different structures are formed on the Si (0001) and C(000-1) faces. While graphene sheets are produced on Si face parallel to the crystal surface, decomposition of carbon face resulted in the growth of vertically aligned carbon nanotube forests. Both carbon structures on SiC can find applications in electronics or tribology. Possible mechanisms governing the formation of two different structures on two different faces of SiC crystals are discussed.

A New Nanosecond Pulsed Uniform Dielectric Barrier Discharge for Medical Applications

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For sterilization of living tissue and sensitive bio-materials "cold" (non-thermal) plasma is required. Medical applications involving living tissue treatment demand uniform plasma in air at atmospheric pressure. When ignited in air at atmospheric pressure, conventional Dielectric Barrier Discharge (DBD) assumes filamentary structure because of streamers. Those filaments having strong local heating effect are undesired for sensitive treatments. Additionally, conventional discharges are very sensitive to gap non-uniformities as they tend to not to ignite at larger gaps while occurring at closer gap locations on the same surface subjected to treatment.
We propose to use nanosecond pulsed DBD system with short pulse width to generate atmospheric pressure uniform plasma in air for medical applications. Emission spectroscopy was employed to measure the vibrational and rotational temperatures of the nanosecond pulsed uniform DBD. Voltage pulse width was obtained as short as 20 ns at the half height with 3 kV/ns voltage front. We have measured uniformity of the new discharge qualitatively with exposing fast moving photofilm to the plasma and proved that discharge is uniform (filament-free). Moreover, discharge ignites uniformly over large range of gap distances (0.1 – 4 mm).

Characteristics of HfO_2 and SiO_2 on p-type Silicon Wafers using Terahertz Spectroscopy

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The effect of high-κ dielectric HfO_2 films on 200mm diameter p-type silicon substrates is investigated and compared with conventional dielectric material, SiO2, using terahertz (THz) time-resolved spectroscopy and visible pump/THz probe spectroscopy. Measurements were performed on two sets of samples, each set containing both HfO2 and SiO2 coated wafers with varying oxide thickness. One set had a protective coating of either photoresist or Si3N4 deposition above the oxide layer which in turn was on a heavily doped p+ layer on p-type silicon. The samples were identical as seen by the THz radiation for all linear experiments except for that under visible excitation. Using an Ar+- Ion laser source as the optical pump, differential measurements show that the transmission of THz radiation is far less for high-κ dielectric HfO2 films than the conventional dielectric SiO2, indicating the presence of a large photo-generated carrier density in the p-type substrate. The difference in photo-generated carriers is discussed in the context of a decrease in Hall mobility observed for devices using HfO2 as the gate dielectric material as opposed to SiO2. The method outlined here has the advantage of probing a much larger portion of the dielectric bearing wafer than electrical measurements which are limited to the device region. While the latter is more important for assessing the dielectric for device applications, differential THz spectroscopy under a visible source can be used as a tool to monitor the interface quality between the high-κ dielectric and substrate before fabrication.

Locust Bean Gum (Ceratonia siliqua): Defining Quality and Functionality for use in Foods Processed at High Temperatures.

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The locust bean (Ceratonia siliqua) is indigenous to the Middle East. Locust bean gum (LBG) has found an important application as a natural and healthy additive in the manufacture of many foods such as ice-cream, soft cheese, processed meats, bakery products and dietetic foods. The gum is obtained by first removing the testa (husk) by roasting and then grinding the endosperm. The standard gum is sold in a range of particle sizes and will often contain finely ground pieces of the testa as a result of attempts to increase yield during the grinding process. The effect of quality on functionality of LBG during heat processing is not well understood therefore a model was developed to interpret the viscosity change through the simulated sterilisation cycle. This took into account the degradation of the polysaccharide and the change in viscosity with temperature at known molecular weight. It was also found that the lower grade material did not degrade as much as the higher grade LBG which is possibly due to the presence of antioxidants leaching from the particulates. Synergistic work with locust bean gum and κ-carrageenan confirm that there are differences in functionality between the soluble fractions of high and low grades. The analytical grade always gave the highest gel break strength value and it was demonstrated using ethanol precipitated samples that this was not simply due to greater galactomannan content.

Packet Probes for Available Bandwidth Estimation in IEEE 802.11 Network

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This study aims to share our wireless testbed experience, gained while evaluating practically feasible available bandwidth estimation techniques for IEEE 802.11 based wireless networks. Naive methods such as promiscuously listening to all packets to calculate remaining unused bandwidth in the vicinity, do not always produce correct results due to interference (which is in the form of undecodable packets) from other wireless nodes around the measuring station. After demonstrating this problem on ORBIT testbed, we propose an application of packet probing approach to rectify such kind of over-estimations. Evaluating these available bandwidth estimation methods requires a malleable MAC protocol implementation, precise MAC layer packet timing measurements, and the ability to create control topologies in laboratory setups so that not all nodes are within communication range. To address these practical challenges, we have exploited IEEE 802.11e-derived features (WMM) to obtain more control over the MAC layer operation of off-the-shelf 802.11 radios and implemented our measurements using CPU timestamp counter and radio hardware timestamps with microsecond resolution. Regarding topology creation, we have experimented with hardware attenuators and noise generation to create defined topologies in a laboratory environment. In addition to presenting the initial performance results from our available bandwidth estimation proposal using packet probes, we also discuss some of the experimental problems/solutions and remaining open issues to provide useful information to other researchers who are likely to face similar challenges while evaluating cross-layer wireless networking protocols on ORBIT testbed or alike.

Virtual Math Teams: Designing Software Support for Collaborative Math Problem Solving Online

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The Virtual Math Teams (VMT) project is an NSF-funded research program through which an interdisciplinary group of researchers at Drexel University investigates innovative uses of online collaborative environments to support effective K-12 mathematics learning. The project aims to extend the existing services of the Math Forum to solicit active participation of students to discuss math problems together, and to share their findings and experiences with other members of the Math Forum online community. In particular, in collaboration with the team of researchers from the IPSI Institute in Fraunhofer, Germany; the project is developing a service that includes a chat-based communication tool called VMT Chat and an integrated Wiki component to support collaborative knowledge building activities of Math Forum users online. The chat tool provides two main interactive components, namely a text-based chat and a shared whiteboard. One of the unique features of this chat system is the referencing support mechanism that allows users to visually connect their chat postings to previous postings or to the graphics on the board. Moreover, in the near future users will be able to automatically publish selected excerpts from their chat discussions on the Wiki, and hence share their findings with other groups. This poster will present the current state of our software development and outline our recent findings regarding how small groups of students put various features of the VMT system into use to co-construct mathematical objects, make sense of them jointly, and incorporate them into solution accounts to address their shared tasks.

Structural Health Monitoring: Current Research Activities and Future Directions

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Structural Health Monitoring (SHM) is currently a very active research area, which deals with the monitoring and condition assessment of structures. With proper design and implementation of SHM, civil infrastructure systems, which are valuable assets of a nation, can be maintained and operated safely and cost-effectively. Major decisions such as rehabilitation, maintenance or renewal can be made objectively. Historically started with aerospace and mechanical structures, civil infrastructures have been one of the main application areas of SHM. However, several challenges and problems remain for effective and efficient implementation of SHM to civil structures. Some of these problems can be listed as selection and extraction of deterioration/damage sensitive features, eliminating environmental and operational variations from the monitoring data, statistical model development and development of successful laboratory studies before field deployment of novel technologies and methods. Currently, the authors' research focus is to address some of these issues and to develop a robust SHM framework by combining different approaches and methodologies. In this study, the authors present some results from the ongoing research activities at the University of Central Florida. Examples of analytical and experimental studies involving different laboratory structures are presented. The authors lead and coordinate an international benchmark study at the University of Central Florida to close the gap between research activities and real life applications. This benchmark study is also discussed. Finally, future directions for a complete and robust SHM application are outlined.

Capacity of a field radiometer to estimate damaged-wheat caused by Russian wheat aphid

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Remote sensing techniques have the potential to provide information on vegetation status. Therefore, this study was designed to determine the ability of a multispectral field radiometer to estimate damage caused by Russian wheat aphid (*Diuraphis noxia* (Mordvilko)) in wheat (*Triticum aestivum* L.). Percentage reflectance data were collected over 1 m^2 wheat plots at 10 sites in 2006. Percentage reflectance data were transformed into spectral vegetation indices. The percentage damage was visually assessed on the ground. The relationships between percentage damage and spectral vegetation indices were investigated using simple linear regression analysis. The results show that there were strong relationships between percentage damage and vegetation indices. The highest and lowest coefficients of determination (R^2) were 0.94 and 0.49, respectively. These results suggest that remotely sensed data can be used to estimate Russian wheat aphid damage to wheat growing production wheat fields with the high degree of accuracy and precision.

The Use of Fictive Constraints in Finite Element Model Updating

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The success of any Model Updating Algorithm can be enhanced by increasing the experimental information on the tested structure. Resonant frequencies and mode shapes identified from measured data have traditionally constituted the information exploited to relate the tested system to its mathematical model. A convenient way to extract information hidden in the apparent featureless portions of the frequency response functions, while retaining the convenience of a contrast between model and data at resonant locations, is by introducing fictive constraints. Fictive constraints provide a view of the available data from the perspective of a modified support configuration. The items examined in this study are how modal truncation and damping in the original system affect the accuracy of the estimated fictive system poles. It is found that the error in the estimated fictive poles due to the modal truncation can easily be avoided by updating a truncated model. On the other hand, the classical damping assumption introduced negligible error in the estimated undamped fictive poles.

Ultra-Low Power CMOS MICS Transceiver

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The Medical Implant Communications System (MICS) is an ultra-low power, unlicensed, mobile radio system for transmitting data between an outside control unit and implanted medical devices in 402-405 MHz frequency range. Biocompatibility, ultra-low power consumption, having extremely small size are some of the challenges in developing an implant device. From an IC designer perspective, power and size constraints are main issues. Since the implants are battery operated devices, they are expected to work with only couple mW's of power that enables them to operate for many years. As in all medical applications the robustness is also an important issue in MICS transceivers. Ultra-low power consumption can be achieved with reduced supply voltage and low drain currents. Reduced supply voltage allows only a few cascoded transistors. Operating the transistors with lowest possible current will push their operations toward weak-to-moderate inversion region. MICS transceiver currently under development, is being designed using 0.18-μm RF CMOS process with reduced supply voltage (Vdd=1 V). Novel circuit design techniques as well as new topologies are being developed for LP-LV RF operations. Direct conversion receiver architecture has been chosen for its low power consumption and high levels of system-on-chip (SoC) integration. Each building block in the system is being designed carefully against the process variations and the possible parasitic RLC degradations to insure first-pass success. Compensation techniques have been developed to cope with process variations and supply voltage variations.

Self-Organization of Sensor Networks for Energy-Efficient and Reliable Data Transport

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Efficient self-organization is a major issue in randomly deployed wireless sensor networks, and should be addressed subject to some important constraints such as reliable data transport, limited energy supply, sufficient sensing area, dynamic path selection and fair load distribution. Existing distributed solutions inherently consider either energy limitations or sensing coverage on the topology construction without addressing dynamic path selection, unexpected node failures and reliable data transfer from and to the sink node. In this study, we propose a self-organization mechanism for wireless sensor networks by constructing a coverage preserving scalable topology under stringent energy and reliability constraints. We present two distributed algorithms for constructing self-organized topology. Each of our algorithms constructs an essential sensor set of size at most an constant fraction of the optimal set, which can achieve reliable data transport and fair energy distribution among sensors. In first solution, nodes are self-organized to preserve sensing coverage based on locations and sensing ranges. In case of heterogeneous nodes, having non-unit disk sensing range, we present an alternative neighbor-based self-organized topology construction based on transmission range without having prior knowledge of node locations. Since many event-critical applications for wireless sensor networks demand for reliable communication service, we further propose an energy-efficient and reliable data transport mechanism to guarantee the minimal reliability to deliver all events and queries using self-organization topology. We demonstrate the capability of our protocols through both analysis and extensive simulations with respect to energy consumption, reliable event detection, event detection delay, packet loss, and energy and load distribution.

Highly Effective Contact Antimicrobial Surfaces via Polymer Surface Modifiers

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This research addresses a methodology for the development of intrinsically sterile surfaces that would have wide applicability such as in catheters, coatings, or other medical devices. Such surfaces could play a vital role in attenuating hospital acquired infections. The concept incorporates structural and compositional guidance from naturally occurring antimicrobial proteins and achieves compositional economy via a polymer surface modifier (PSM).To implement this concept, polyurethanes were prepared having random copolymer 1,3-propylene oxide soft blocks with alkylammonium and either trifluoroethoxy or PEGlyted side chains. Six carbon (C6) and twelve carbon (C12) alkyl ammonium chain lengths were used. These PSM-polyurethanes were co-processed in small amounts (2 wt%) with conventional polyurethanes. An innovative test was developed employing aerosol pathogen challenge, in order to mimic a cough or sneeze. Recent results showed that PSM modified conventional polyurethanes are highly effective (100% kill) against pathogens including strains of *Pseudomonas aeruginosa*, *Escherichia coli* and *Staphylococcus aureus* via contact kill. A zone of inhibition test showed no biocide release for PSMs and PSM modified compositions.

Locust Bean Gum (Ceratonia siliqua): Defining Quality and Functionality for use in Foods Processed at High Temperatures.

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The locust bean (*Ceratonia siliqua*) is indigenous to the Middle East. Locust bean gum (LBG) has found an important application as a natural and healthy additive in the manufacture of many foods such as ice-cream, soft cheese, processed meats, bakery products and dietetic foods. The gum is obtained by first removing the testa (husk) by roasting and then grinding the endosperm. The standard gum is sold in a range of particle sizes and will often contain finely ground pieces of the testa as a result of attempts to increase yield during the grinding process. The effect of quality on functionality of LBG during heat processing is not well understood therefore a model was developed to interpret the viscosity change through the simulated sterilisation cycle. This took into account the degradation of the polysaccharideand the change in viscosity with temperature at known molecular weight. It was also found that the lower grade material did not degrade as much as the higher grade LBG which is possibly due to the presence of antioxidants leaching from the particulates. Synergistic work with locust bean gum and κ-carrageenan confirm that there are differences in functionality between the soluble fractions of high and low grades. The analytical grade always gave the highest gel break strength value and it was demonstrated using ethanol precipitated samples that this was not simply due to greater galactomannan content.

Study of pion photo-production using a TPC detector to determine the structure of the nucleon

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The Laser Electron Gamma Source facility (LEGS) provides polarized γ-ray beams by Compton backscattering laser light from relativistic electrons circulating in the X-Ray storage ring of the National Synchrotron Light Source at Brookhaven National Laboratory. The LEGS Spin Collaboration has developed the equipment and techniques necessary to determine fundamental properties of nucleon. Series of double-polarization experiments designed to study the helicity structure of the nucleon and evaluate spin-polarizability and GDH sum rules. The neutral-pion measurements were completed in 2005 by using the Spin ASYmmetry detector system (SASY). The charged-pion experiments were completed in 2006 and will yield data on the double-polarization observables as well as beam asymmetry and cross section data for the neutron and the proton. Pion production from the neutron will provide unique information needed to unravel the structure of the nucleon. Time Projection Chamber (TPC) was built and added into SASY to identify the charged pions and so separate neutron and proton reactions. The TPC provides snap-shots of ionizing tracks of particles produced by 190-422 MeV polarized beam and target. Data were collected with four different spin combinations for H and D polarizations: P(H) = +57%, P(D) = +22% ; P(H) = +26%, P(D) = +34% ; P(H) = –10%, P(D) = +31% ; P(H) = 0%, P(D) = +31% . RF transitions were used to move polarization from H to D, then to flip H and finally to zero H. Data analysis and calibration is in progress and some preliminary results will be shown.

The Variational Frequency Amplitude-Only Microwave Technique for Materials Characterization

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Microwave nondestructive testing (MNDT) methods have advantages over other nondestructive testing methods (such as radiography, ultrasonics, and eddy current) in terms of low cost, contactless feature of the microwave sensor (antenna), good resolution and superior penetration in nonmetallic materials, and are known as excellent candidates for aquametry in environments in which moisture content determination is sought. Areas that may benefit from using MNDT techniques are: 1) composite inspection, 2) dielectric material characterization, 3) metal surface inspection, 4) microwave imaging, 5) medical and industrial applications. Attenuation and phase shift are generally used to determine the electrical properties (permittivity, permeability, etc.) of MUT by non-resonant methods. However, phase measurements are not suitable for dynamic measurements since the measured value of the phase shift may differ by an integral multiple of 2π from actual value. To obtain the actual value of phase shift, either additional measurement should be performed using another material having the same properties but a different thickness of material under test, or comparing the measured and computed group delays at different frequencies. In addition, any small shift from the measurement plane of the sample results in enormous phase shift errors while amplitude measurements are not affected. Finally, the phase uncertainty of reflection measurements for low-loss materials increases when sample thickness is of integer multiples of one-half wavelength. Amplitude-only techniques can be utilized to avoid these problems.

We developed a new simple yet accurate technique (variational frequency amplitude-only technique) for materials electrical characterization. The basis of the technique is to use the frequency as an independent parameter in measurements because electrical properties are functions of frequency. In this paper, we describe the basis of the technique, introduce its weaknesses and strengths, and discuss the expected applications.

A Geometric Transformation to Protect Minutiae-Based Fingerprint Templates

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The increasing use of biometrics in different environments presents new challenges. Most importantly, biometric data are irreplaceable. Therefore, storing biometric templates, which is unique to individual user, entails significant security risks. In this paper, we propose a geometric transformation for securing the minutiae based fingerprint templates. The proposed scheme employs a robust one-way transformation that maps geometrical configuration of the minutiae points into a fixed-length code vector. This representation enables efficient alignment and reliable matching. Experiments are conducted by applying the proposed method on a synthetically generated minutiae point sets. Preliminary results show that the proposed scheme provides a simple and effective solution to the template security problem of the minutiae based fingerprint.

Scorpionism In Children In Sanliurfa, Turkey

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The epidemiological and clinical findings of scorpion stings in Şanlıurfa region of Turkey were evaluated in this investigation from May to September 2003, because of the high incidence of scorpionism cases during this season. Scorpion envenomation is an important health problem in all South-eastern Anatolia specifically in Şanlıurfa. The sting cases mostly occurred in the month of July (37.6 %) when yearly temperature is the highest. Scorpion species causing the envenomation in children were not identified. More of the patients were adolescents (54.1 %). Most of the stings were seen in exposed extremities (87.7%), mainly in the upper limbs (47.1%). One single village, Birecik, had the highest number of incidents (36.5 %). Patients at the emergency units showed signs of local and systemic effects, but no lethality occurred. Local and autonomic nervous system effects were most frequently characterized by local pain, hyperemia, swelling, burning, hypotension, hypertension, dry mouth, thirst and sweating. We propose that public awareness and physician readiness combined with the availability of effective antivenom significantly reduced lethality in this region.

Assessing the Health-Related Quality of Life (HRQoL) of a Clinical Sample of Obese Adults in Turkey

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Obesity is an international epidemic, the prevalence of which is increasing in many parts of the world. In the TEKHARF (Turkish Adults Hearth Disease and Risk Factors) cohort study in Turkey, the prevalence of obesity was 12 % in males and 32 % in females for ages 30 and over in 1990. A decade later, the TEKHARF 2001/2002 cohort revealed a striking increase to 25 % in males and 44 % in females. The relationship between obesity and increased risks of morbidity and mortality is well established. However, limited research exists in Turkey to document the impact of obesity on physical and psychosocial functioning as well as general well-being. The aim of this study was to assess the health-related quality of life (HRQL) of 250 randomly selected obese adults aged 21 to 65 years in Dr. Lutfi Kırdar Research and Training Hospital, Endocrinology and Metabolism Outpatient Department in Istanbul, Turkey. The Turkish version of the Finish 15D was used to measure HRQoL. The overall findings indicated that obesity had a major impact on HRQoL as shown by the mean 15D score of 0.59 for the whole sample. The mean 15D score was lower in women (0.55) than men (0.69) ($p< 0.001$). Significant gender differences were found in hearing ($p<0.001$), elimination ($p<0.05$), usual activities ($p<0.01$), mental function ($p<0.05$), depression ($p<0.001$), distress ($p<0.01$), vitality ($p<0.05$), and sexual activity ($p<0.001$). Additional research is needed to develop appropriate medical and life-style interventions to enhance and sustain positive changes in HRQoL of Turkish obese adults.

Investigating KCNE1 Glycosylation and its Effect on KCNQ1-KCNE1 K+ Channel Complex Assembly

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The KCNE peptides are a class of type I transmembrane N-linked glycoproteins that assemble with a variety of voltage-gated K+ channels in a tissue specific manner. KCNE β-subunits modulate the gating and ion conducting properties of K+ channels; hence formation of these heteromeric complexes enhances K+ current diversity. In the heart and inner ear, KCNE1 co-assembles with KCNQ1 to form a voltage gated K+ channel complex. Genetic mutations in either KCNE1 or KCNQ1 give rise to several inherited diseases of the cardiac rhythm and neural deafness, namely Romano-Ward and Jervell-Lange-Nielsen Syndrome. The JLNS mutation, T7I, indirectly prevents glycosylation at one of the two N-linked glycosylation sites on KCNE1. In order to elucidate the positional importance of N-linked glycosylation of KCNE1, we constructed a C-terminally tagged KCNE1 that behaves like wild type in terms of channel assembly and function. Using this construct, we show that the glycosylation site proximal to the KCNE1 N-terminus (N5) is critical for the formation of KCNE1 protein, whereas removal of the second glycosylation site (N26) has no effect on KCNE1 protein expression or assembly with KCNQ1. To further investigate the structural requirements of KCNE1 glycosylation, we are performing successive truncations of KCNE1 and positional glycosylation scanning mutagenesis. Examination of the biogenesis, complex formation with KCNQ1, and cell surface expression of these mutants will define the glycosylation window that is important for proper KCNE1 assembly and trafficking.

The Binding Interface in between Cytochrome *c* and Nanoparticles

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Protein–protein interactions are central to complex biological signaling processes such as chemotaxis and apoptosis, as well as simpler reactions such as interprotein electron transfers. Control over interprotein interactions in cancer is important for therapeutic applications. Mimicking natural protein recognition is key to developing biomimetic antagonists, however engineering the large surface required are challenging. Nanoparticles can be synthesized at the size of proteins. The surfaces of nanoparticles modified with various functional groups holds great promise for controlling biomolecular recognition. We previously showed that mixed monolayer protected gold nanoparticles could selectively recognize either cytochrome *c* (Cyt *c*) or cytochrome *c* peroxidase and disrupted their mutual binding. Herein, we report that amino acid functionalized gold nanoparticles bind to Cyt *c* with surface specificity mimicking that of natural redox partners. Amide hydrogen/deuterium exchange is used to determine the binding interface of Cyt *c* with nanoparticles.

Fetal Bovine Serum Inhibits Chondrogenesis Induced by TGF-β1 in Synoviocytes

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Tissue engineering of cartilage, which has a very limited regenerative ability, is a promising alternative to current treatments of cartilage damage. Tissue engineered cartilage is typically produced using chondrogenic cells seeded on scaffolds cultivated in growth media supplemented with fetal bovine serum (FBS) and growth factors. Synovial fibroblasts (SF) have been proposed as a novel primary cell source for cartilage tissue engineering to overcome the limitations of current cartilage tissue engineering technologies. In this study we employed a pellet culture system, which provides a highly cellular three-dimensional structure inducing differentiation and extracellular matrix synthesis. In vitro culture systems require a fine balance of biochemical and mechanical components to maintain the chondrocyte phenotype. We investigated the effects of fluid-dynamic stimuli, fetal bovine serum, and dexamethasone on the chondrogenic potential of SF pellet cultures in the presence of TGF-β1, cultivated for 14 days and analyzed for glycosaminoglycans (GAG), type II collagen and DNA contents. Mechanical stimuli enhanced GAG deposition, whereas FBS seemed to inhibit GAG and type II collagen production. Dexamethasone addition during the first 7 days resulted in enhanced GAG production and increased cellularity. Presence of FBS in addition to ITS+ and TGF-β1 did not significantly increase cell proliferation. These results indicate the importance of a comprehensive analysis of growth conditions for each cell source. The SF cells show chondrogenic potential and our goal is to produce engineered cartilage using synoviocytes seeded on clinically relevant scaffolds.

Doubly Curved Crystal X-Ray Optics Alignment System for High Intensity

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Doubly curved crystal (DCC) optics can provide an intense monochromatic focusing beam from a laboratory point x-ray tube. DCC optics has applications in crystallography, x-ray fluorescence, and imaging. In order to obtain the maximum intensity from DCC optics, the alignment must be optimized in six degrees of freedom. In practice, because the alignment in one axis affects the response in other axes, it can be difficult and time consuming to insure optimal performance. A simple, rapid, reproducible alignment technique has been developed. With this alignment procedure, multiple DCC optics has been tested for focusing characteristic radiation from a low power x-ray laboratory point source.

Determination of Slime Production by Coagulase-Negative Staphylococci and Enterotoxigenic Characteristics of Staphylococcus aureus Strains Isolated from Human

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The present study was designed to determine slime production of coagulase-negative staphylococci (CoNS) and to characterize enterotoxigenic properties of Staphylococcus aureus strains isolated from human clinical specimens. For this purpose, 183 Staphylococcus strains were isolated by Sceptor Bacteria Identification System (Becton Dickinson). Of the tested strains 118 (64.5%) were found to be S. aureus, and the others 65 (35.5%) were CoNS. Sixty five CoNS were identified; 20 (10.9%) as S. hominis, 18 (9.8%) as S. epidermidis, 6 (3.3%) as S. xylosis, 6 (3.3%) as S. warneri, 5 (2.7%) as S. sciuri, 4 (2.2%) as S. haemolyticus, 2 (1.1%) as S. simulans, S. capitis and S. saprophyticus respectively. Thirty nine (60%) of 65 CoNS were found to be slime producer. Among the 118 S. aureus strains tested, 67 (56.8%) were found to be enterotoxigenic. Of these 45 (38.1%) were positive for staphylococcal enterotoxin A (SEA), 9 (7.6%) for SEB, 9 (7.6%) for SEC, and 4 for (3.4%) SED. The results of this study showed that slime factor rate in CoNS were very high in clinical isolates. Data from the present study also showed that S. aureus strains isolated from human clinical specimens produced more SEA compared to other SEs.

Phosphoinositide 3-kinase-independent nongenomic signals transit from the androgen receptor to Akt1 in membrane raft microdomains

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Akt1/protein kinase B alpha plays an important role in cells by participating in growth, survival and apoptotic signaling pathways. Recent studies have demonstrated that the Akt1 serine-threonine kinase mediates survival signals in LNCaP prostate cancer cells through detergent-insoluble, cholesterol-rich membrane microdomains (aka, "lipid rafts"). Here we address the role of the lipid raft as a potential focal point for the intersection of androgen/AR and Akt1 signaling. A subpopulation of AR was found to localize to a raft or raft-like subcellular compartment. AR interacted with Akt1 preferentially in lipid raft fractions, as measured by co-IP, and androgen further enhanced this interaction. The anti-androgen, Casodex, or a specific EGFR inhibitor, AG1478, inhibited the AR/Akt1 interaction; however, inhibition of PI3K by LY294002, or c-Src by PP2, had no effect, indicating that AR interaction with Akt1 is dependent on AR activation by androgen as well as EGFR activity. Androgen promoted endogenous Akt1 phosphorylation and kinase activity in lipid raft fractions within 10 min of treatment. Furthermore, the fusion of a palmitoylation/myristoylation sequence to hAR (p/m-hAR) enhanced AR localization to rafts, androgen-mediated Akt1 activity, and reduced the LNCaP cells' dependence on constitutive signaling through PI3K for cell survival. These findings suggest that signals channeled separately through AR and Akt1 may intersect by a mechanism involving a direct protein-protein interaction within lipid raft microdomains. Our results indicate that lipid rafts play a role in transmitting non-genomic signals involving androgen and AR in prostate cancer cells.

Needle Exchange Programs and Student Pharmacists: Combining Efforts to Expand the Use of Harm Reduction Services and Assess the Attitudes of Healthcare Professionals Toward Needle Exchange.

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The objectives of this project are to expand the use of harm reduction services offered by a local needle exchange program (NEP) and to assess current attitudes of health care professionals and student health care professionals toward NEPs.

Methods: NEPs effectively reduce transmission of bloodborne pathogens associated with injectable drug use by providing injectors with sterile syringes in exchange for used syringes. In addition, many NEPs provide drug treatment program placement, HIV testing and other valuable public health services. It is imperative that healthcare professionals understand the benefits associated with NEPs so that they may encourage patients in need to make use of these valuable services. Student pharmacists collaborated with a local NEP in an effort to expand the use of the site's harm reduction services. Students will encourage the use of clinic services, such as HIV testing and Hepatatis A and B vaccination, by distributing clinic service information flyers to participants at the NEP site. Students will also encourage the use of needle exchange services by distributing needle exhange information flyers to local HIV clinics and drug rehabilitation facilities. Students have initiated volunteer services on a weekly basis at the local NEP and mobile health clinic, providing medication counseling services and educating injectable drug users (IDUs) about the importance of sterile syringe use. The outcome of these efforts will be measured by comparing the rate of clinic visits and the volume of needles exchanged at baseline to the rates of clinic visits and the volume needles exchanged each week after the initiation of the informational flyers and counseling services. Student pharmacists assessed the attitudes of Philadelphia area health care professionals and student healthcare professionals toward syringe exchange programs with the use of a nine question survey and likert scale. The results will be assessed in order to determine the need for increased awareness of the benefits of needle exchange.

Results: Preliminary survey results indicate a need for increased awareness of the benefits of needle exchange programs. Pharmacy practice services have been successful in offsetting staff requirements and providing care to an otherwise underserved population of IDUs. The impact of the flyers and counseling services on the rates of clinic visits and volume needles exchanged has not yet been determined.

Conclusions: Future efforts are needed to increase awareness of the public health benefits of NEPs among health care professionals.

Avian influenza (H5N1) infection in Eastern Turkey in 2006

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An outbreak of highly pathogenic avian influenza A (H5N1) virus had previously been detected throughout Asia and had major economic and health repercussions. In January 2006, this outbreak extended to Eastern Turkey. We report the epidemiologic, clinical, and radiological features of 8 patients with confirmed H5N1 virus infection who were hospitalized in Yüzüncü Yıl University Hospital in Van between December 31, 2005 through January 10, 2006.

Six hundred and twenty five patients were admitted to our hospital with suspected avian influenza during this period. Two hundred ninty patients (139 had a history of suspicious contact with fowl and 251 had clinical findings compatible with flu) underwent three H5N1 diagnostic tests; rapid test, ELISA and real time PCR. All of the samples were found negative for Influenza A with the rapid and ELISA tests. H5N1 virus was detected in 10 of these patients by means of real time PCR and 8 of these cases were confirmed by the WHO Laboratory The eight patients were between 5 to 15 years of age and all had a history of close contact with ill or dead chickens. The mean time between exposure and the onset of illness was 5±1.3 days**.** All patients had fever, seven had clinical and radiological evidence of pneumonia at presentation and 4 died.

Avian influenza A (H5N1) causes a spectrum of human illness including severe and fatal respiratory disease. Diagnosis of this infection can be difficult. Coordinated public health efforts may control an outbreak.

Investigation of Intra-Cortical Circuitry of rodent Prefrontal Cortex using Simultaneous Intracellular and Multiple Unit Recordings in-vivo

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Medial prefrontal cortex (pFC) is involved in higher level associational functions and various other processes; yet our knowledge on intra-cortical physiology of rodent pFC remains incomplete. Slow oscillation (0.5-1 Hz), composed of prolonged depolarizations (up state) of the membrane potential followed by long lasting hyperpolarizations (down state), is the major SWS rhythm and the main cortical pattern detected under anesthesia (Steriade et al., 1993). pFC not only prominently exhibits but also is assumed to be the originator of the slow oscillation. Therefore, investigation of this widespread change in the cortical excitability offers a great opportunity to examine the intra-cortical circuitry; in terms of the impact of global activity states on the single cell, and the interactions between cell groups of different layers and sub-regions. To address these issues, we performed simultaneous intracellular recording from single neurons together with extracellular recordings, using a high density silicon probe, from the pFC of the anesthetized rats. As expected, our preliminary analysis revealed clear up-down states in frontal neocortical cells during anesthesia. The relationship between the multiple unit activities (MUA) and the field, and the membrane potential of the single cells with reference to the ongoing oscillatory activity are currently being explored by quantitative analysis. Further analysis will bring out the physiological and morphological properties of frontal cells and the characteristics of the MUA across different layers. In addition, investigation of the monosynaptic connections between the extracellularly recorded units and the intracellularly recorded cells will reveal better understanding of the intra-cortical connectivity. Acknowledgements: Authors thank to Yoshikazu Isomura, Eva Pastalkova, Sebastien Royer, and Sean Montgomery for their contribution.

Factors Affecting in utero Retroviral Transduction Efficiency

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In utero gene therapy offers numerous advantages over adult gene therapy. These include a naïve immune system, the highly proliferative state of stem cell populations, high vector-to-cell ratio due to smaller size, and therapy prior to disease onset. We have transferred marker genes to various fetal sheep organs including liver, lung, brain, and thymus via retroviral (MMLV) vector supernatants. Additionally, we have demonstrated that the efficiency of gene transfer to these fetal organs appears to be dependent on gestational age. These studies showed that significantly higher levels of transduction/transgene expression occurred in the liver at earlier gestational ages, while the lung transduction efficiency correlated directly with recipient age. These results indicated that the developmental stage of the organ is important for transduction. We hypothesized that gestation-related alterations in the levels of the amphotropic receptor, PiT-2, used by the retrovirus for attachment and penetration were responsible for our observations. We generated an antibody to ovine PiT-2 and developed an ELISA to determine whether the age of each tissue impacts upon its levels of PiT-2 expression. We also developed a semi-quantitative RT-PCR assay to quantify the expression of PiT-2 at the mRNA level in liver and lung tissues at different gestational ages. Currently, we are designing sheep-specific primers for more efficient real-time Q-PCR assay as an additional means of quantifying the levels of PiT-2 gene expression. It is hoped that these ongoing studies will enable us to determine the optimal stages for gene delivery to each of the major fetal organs.

Understanding and Improving Pediatric Cardiovascular Fluid Dynamics

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Physiology and anatomy of the fetal, neonatal and pediatric circulation system is considerably different and complex compared to the adult cardiovascular system. Pediatric congenital cardiovascular disease states are even more complicated and variable. Clinicians report that over 50% of their time must be devoted to the 20% fraction of their patients having this complex cardiovascular physiology. Our research group aims to understand this unique physiology and improve hemodynamics (fluid dynamics of blood flow) and post-operative outcome of pediatric surgeries/interventions from a biomechanical engineering perspective. Biomedical engineering tools that we developed are founded on computational fluid dynamics, in vitro pulsatile flow loops, particle image velocimetry and span surgical planning and magnetic resonance imaging. Selected ongoing research projects will be presented. These include improving reconstructive surgeries of complex congenital heart defects, multi-scale patient-specific modeling, fetal hemodynamics and pediatric medical device design.

Relationship between Paraoxonase 1 (PON1) Activity and Metabolic Syndrome

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Paraoxonase 1 (PON1) is a calcium dependent esterase which has gycoprotein structure and associated with the HDL. PON1 is also associated with the triglyceride rich lipoproteins (chylomicrons and VLDL). Epidemiologic, genetic and biochemical studies support antiatherogenic role for PON1. Antioxidant activity of PON1 is due to cystein aminoacid part of its structure. In previous studies have demonstrated that PON1 both prevent the formation of oxidized LDL and HDL. It has lipidperoxid hydrolysis capacity, by this way it decreases hydroperoxide accumulation in the HDL and LDL. It has been suggested that low PON1 activity is related to coronary heart disease (CHD). Low PON1 has been shown in oxidative stres associated processes such as dyslipidemia. Dyslipidemia is one of four criteria of metabolic syndrome (MS). Dyslipidemia is also a risk factor for CHD. Aim of our study is to evaluate plasma PON1 activity in the metabolic syndrome and to investigate relationship between PON1 activity and CHD in metabolic syndrome. Therefore we investigated the correlations between PON1 activity and fasting glucose, HDL cholesterol (HDL C), Tryglyceride and malondialdehyde (MDA) levels. PON1 activity was measured by the Eckerson method in 100 patients with MS according to the International Diabetes Foundation and 26 healthy subjects. PON1 activity was significantly lower and MDA levels were significantly higher in subjects with the MS compared with healthy subjects ($p<0.05$). PON1 activity was significantly lower and MDA levels were significantly higher in the MS with CHD compared with the MS without CHD ($p<0.05$). There was no correlation between PON1 activity and HDL C levels ($p>0.05$, $r=0.15$), TG levels (($p>0.05$, $r=0.14$), fasting glucose levels ($p>0.05$, $r=-0.008$) in MS. As a result; PON1 activity is associated with MS and it may be used for indicator of CHD in subjects with the MS.

Novel oligonucleotide based array-CGH system for detection of genome wide copy number changes including subtelomeric regions for genetic evaluation of mental retardation

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Developmental delay (DD) and mental retardation (MR) are important child health issues with a prevalence of 1%. Karyotyping with or without subtelomeric FISH (fluorescent in situ hybridization), unless the phenotype of the patient suggests a specific aberration for a specific FISH assay, is the most common procedure in cytogenetic evaluation of MR/DD. In addition, there are several platforms utilizing microarray based comparative genomic hybridization technology (array-CGH) for genetic testing. Array-CGH can detect deletions or duplications in very small segments of chromosomes and the use of this technology is expected to increase the diagnostic yield. The major limitation of the current BAC based array technologies is the low resolution (~1MB) of the chip and suboptimal coverage particularly in the subtelomeric regions. Our aim was to design a novel array-CGH chip with high-density of probes in the subtelomeric regions as well as to maintain sufficient density in other regions of the genome to provide comprehensive coverage for DD/MR. For this purpose, we used Human Genome CGH Microarray 44B chip (Agilent) as the template for the novel design. Using e-array 4.0 (Agilent), one third of the probes were randomly removed from the chip and replaced by 14,000 subtelomeric probes. The average density of the probe coverage is 125 KB and 250-400 probes interrogate subtelomeric regions. To evaluate the chip, we tested fifteen samples (including subtelomeric aberrations and other microdeletion syndromes), which were previously analyzed by karyotyping and/or FISH. The concordance rate between array results and previous results is 100%. In addition we detected two novel aberrations that were not detected by karyotyping. These results demonstrate the utility of this format of array-CGH in detecting genome wide submicroscopic copy number changes as well as providing comprehensive coverage of all subtelomeric regions.

Binding Specificity of a DNA Repair Enzyme, PARP-1.

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Poly(ADP-ribose) polymerases (PARPs) are nuclear proteins that can use NAD+ as a substrate and polymerize ADP-ribose onto itself and other proteins. PARPs have been shown to contribute to DNA repair, cell death pathways, chromatin structure, transcription, and mitotic apparatus function. PARP inhibitors have been effective anti tumor agents especially in BRCA1 lacking breast cancer cells. We investigated the binding specificity of PARP-1 by surface plasmon resonance (SPR) technology. We compared binding kinetics of PARP-1 to oligos simulating single stranded breaks, double stranded breaks and single stranded breaks with a T-loop. The binding affinity for PARP-1 was greatest for the double stranded break containing DNA. PARP1 enzymatic activity was also measured on SPR sensorchip surface as self polyadenylation. We also investigated the dimerization of PARP-1 by using cross linking and western blotting. Cross-linking data suggests that PARP exists as dimer alone, but binds to DNA and NAD as a monomer. Additionally, PARP only polymerized ADP-ribose (from NAD) in the presence DNA breaks. Our results provide a novel method for PARP binding interactions using surface plasmon resonance technology. Also we describe a possible mechanism for which PARP interacts with DNA, especially with the double stranded DNA breaks.

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The Nutrient Quality of Brown Comber (Serranus hepatus, Linnaeus, 1758) From Discard Sea Products in Mersin Bay (Northeastern Mediterranean)

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Untargeted species or individuals caught during fishing operations have been a cause of loss in income and even of danger for fishermen for centuries. Recently, the magnitude of the problem has been brought to the attention of fisheries scientists. Globally, the highest by-catch and discard rates have been obtained during shrimp trawling. It is known that shrimp trawls that used especially in Eastern Coast of Mediterranean (Turkey), yield significant discard and by-catch rates, but there is no scientific and statistical data related to the subject. In this study, nutrient quality of Brown comber (Serranus hepatus Linnaeus, 1758) from discard sea products in Mersin Bay (Northeastern Mediterranean) was investigated. Two samplings, one in April and the other in October, were done for the analysis. Lipid content of Brown comber was analyzed according to Bligh and Dyer, protein content by micro-Kjeldahl methods. Moisture contents of samples were determined by drying homogenized samples at 70 °C for 14 hours. The ash content was analyzed by burning the samples at 550 °C for 6 hours. The average values of lipid, protein, moisture and ash for the Brown comber meat were, 4.19%, 12.02%, 73.2% and 7.85%, respectively. The data imply that, although the Brown comber is regarded as a discard fish, it has high nutritional quality. Therefore, this fish species can be used as a food component or as a supplementary food for various cultured species. This will, in turn, provide an additional income for the local fishermen, and indirectly will help the ecological state of the region, since it will prevent back discard of the species to the marine ecosystem.

Unique Continuation for a Hyperbolic Equation Across a Timelike Hyperplane (global Carleman estimates)

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In the domain $Q = \Omega \times (-T, T)$ we consider equation

$$Pu \equiv \partial_t^2 u - \sum_{i,j=1}^{n} a_{ij}(x,t)\,\partial_i \partial_j u + \sum_{i=1}^{n+1} a_i(x,t)\,\partial_i u + r(x,t)u = f(x,t), \qquad (1)$$

where $a_{ij} = a_{ji} \in C^1(\overline{Q})$, $a_s, r \in L^\infty_{loc}(Q)$, here we use the following notations: $x = (x_1, ..., x_n) \in \Omega \subset \mathbb{R}^n_x$, $x_1 > 0$, $t = x_{n+1} \in (-T, T)$, $\partial_{n+1} = \partial_t = \frac{\partial}{\partial t}$, $\partial_t^2 = \frac{\partial^2}{\partial t^2}$, $\partial_i = \frac{\partial}{\partial x_i}$, $\partial_i \partial_j = \frac{\partial^2}{\partial x_i \partial x_j}$, $1 \le i, j \le n$, $1 \le s \le n+1$ and the bounded domain Ω has the following property: for any $x \in \Omega$ there exist a cone $K_x \subset \Omega$ with base lying in the plane $x_1 = 0$. We consider the unique continuation across the plane $x_1 = 0$ and an inverse problem. We establish the conditional stability in the continuation and prove conditional stability of a solution in the inverse problem of determining a coefficient *r (x)* from additional information about a solution of the direct problem. The key is a Carleman estimate in level sets of paraboloid shapes.

Chiral Separation of Nadolol Using Cyclodextrin Modified Micellar Electrokinetic Chromatography

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Nadolol (Corgard®), 5-{3-[(1,1-dimethylethyl) amino]-2-hydroxypropoxy}-1,2,3,4-tetrahydro-cis-2, 3-naphthalenediol, is a beta-blocker widely used in the management of hypertension and angina pectoris. It non-selectively blocks beta-1 adrenergic receptors which are mainly located in the heart, inhibiting the effects of the catecholamines epinephrine and norepinephrine and decreasing heart rate and blood pressure. It also blocks beta-2 adrenergic receptors which are located in bronchiole smooth muscle, causing vasoconstriction. As shown in Figure 1, nadolol has three stereogenic centers which result in eight possible stereoisomers. However, it has been speculated that the two hydroxyl groups at the 2- and 3-position of the tetrahydronaphthalene ring are "conformationally locked" in the *cis*-configuration and thus are considered as one chiral center [1-3]. The other chiral center is the hydroxyl group at the side chain. Thus, only four peaks have been observed so far from enantioseparation of nadolol using HPLC [4-6], SCF [7], and CE [2, 3]. Unlike previous studies, the enantioseparation of nadolol using a combination of L-leucine based molecular micelle and sulfated cyclodextrins as selectors in cyclodextrin modified micellar electrokinetic chromatography resulted in eight peaks. It is interesting to note that, only four peaks were observed using either molecular micelle or CD alone, however, a total of eight peaks were detected with the combination of the two. It is proposed that the combination of these selectors causes a conformational change in nadolol structure that leads to an efficient interaction between the selector and nadolol molecule, which results in a baseline enantioseparation of eight stereoisomers (Figure 2).

Figure 1. Chemical structure of nadolol.

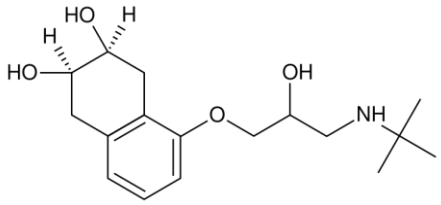
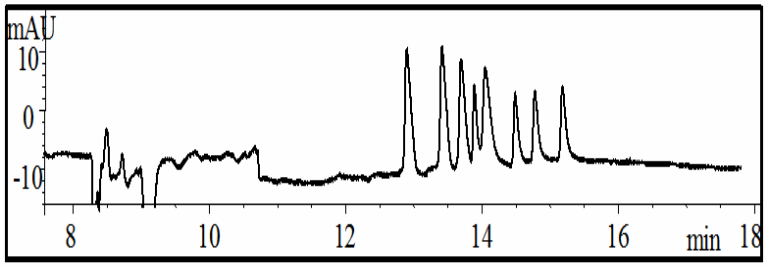


Figure 2. Chiral separation of nadolol using cyclodextrin modified micellar electrokinetic chromatography.



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Resonant Mapping of Occupied and Unoccupied surface states of Cu(111)

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We report resonant band mapping using angle-resolved two-photon photoemission measurements of occupied sp-like surface and unoccupied image states of Cu(111) surface using a tunable ultrafast femtosecond light. An optical parametrically amplified visible beam is frequency doubled to obtain a tunable fs UV source with photon energies in 3.6 to 5 eV range. Unoccupied image states are populated by resonant excitation from the occupied surface state of Cu(111). The image state electrons are then probed by absorption of a second photon of the same energy. Since the surface and image states have different effective masses, resonant excitation occurs at different parallel momenta for each photon energy. By tuning the photon energy we are able to resonantly map both the surface and image state spectra. Our fs laser provides high signal to noise ratio and ultrafast time resolution and the resonant mapping scheme allows for precise measurement of the dispersion and reference planes (the dispersion minimum) of the occupied and excited bands.

How many papers should be retracted?

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We present computational tools to analyze retraction of scholarly articles published over the last five decades in over 4,000 journals. We estimate that the proportion of undetected retractable articles exceeds 0.1% under the most optimistic scenario—about 20 times greater than the actual proportion of retractions. Our analysis suggests that the distribution of retractable articles is nearly uniform among the high- and low-impact journals; however, retractions occur predominantly in the high-impact journals because of their higher visibility and more rigorous post-publication quality control. Hence, the lower-impact journals bear the lion's share of the undetected-retractable papers.

Measuring the Quality of Science in Countries

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The scientific productivity of a country is usually measured in terms of the number of articles. However, this measure omits the quality of the research that is reported and it may safely be stated that quality is more important than quantity when it comes to assessing scientific productivity. Here, I present an objective quantitative measure of scientific quality which uses journal impact factors. My results indicate that, in fact, quantity and quality positively correlate, which implies that as the number of experts in a country increase, the self-controlling mechanisms will also improve and lead to higher quality science. This approach has the potential to point out the reasons and offer strategies for a higher quality science.

Stability Analysis of Delay Population Dynamics under Allee Effects

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In 1931, Allee demonstrated that a negative density dependence, the so called Allee effect, occurs when population growth rate is reduced at low population size. The Allee effect refers to a population that has a maximal per capita growth rate at low density. This occurs when the per capita growth rate increases as density increases, and decreases after the density passes a certain value which is often called threshold. This effect can be caused by difficulties in, for example, mate finding, social dysfunction at small population sizes, inbreeding depression, food exploitation, and predator avoidance of defense. In the present work, we mainly focus on the stability analysis of the following general non linear delay difference equation with or without the Allee effect

$$N_{t+1} = \lambda N_t f(N_{t-T}) \quad \text{(equation 1)}$$

where λ is per capita growth rate which is always positive, N_t represents the population density at time t, T is the time sexual maturity. Here, $f(N_{t-T})$ is the function describing interactions (competitions) among the mature individuals. It is generally assumed that f continuously decreases as density increases. We should note that Eq. (1) is an appropriate model for single species without an Allee effect. Therefore, a natural question arising here is that "How the stability of equilibrium points is effected when the population density in Eq. (1) is subject to an Allee effect?". In this work, we answer this question.

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Intraspheral and interspheral extinctions: an explanatory classification

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The history of life on earth has not been steady as imagined by Sir Charles Lyell, because there are global events that affect it in short time scales. In the Phanerozoic alone we recognise at least six major extinction events that played havoc with various parts of the living mass of our planet. The durations of these global events have long been discussed and interpretations of their reign have ranged from millions of years to a few tens of thousands of years. It has also been clear for sometime that we are now living in one of the greatest extinction events in the history of the globe. Its 'greatness' is a measure of the rate of extinction which seems stupendous: Every year some 40.000 species is currently becoming extinct. As both Buffon and Cuvier pointed out already in the 18th century, no species seems to have formed since Aristotle wrote his zooloigcal works, i.e. during the last 2300 years. Now what does this mean? The number of species now living on earth has been estimated anywhere between 3.6 and 117 million! If the first number is correct, with the present rate of extinction we would have only 90 years to wipe out the living mass of this planet. If the second is correct, we have only three millenia left to do the same. However, generally 25 million species is admitted to be present now, so that we might have only 625 years, so about half a millenium to destroy completely the living beings on our planet. So far no past extinction has been claimed to have been this fast. But neither do we have the means to resolve such fine time intervals in the past as a few thousnd years. Even if this assumption is not exactly true we still have to worry about our future on Earth because it is well accepted the rate of speciation has been declined through the Phanerozoic and now the rate of extinction far exceed by orders of magnitude the rate of speciation: to the extent that latter can be regarded almost as negligible. Is the present extinction any different from past ones? Could the past ones have been so swift as the present one seems to be? We have compared the nature of the past extinctions with the present one. What was common to the past extinctions was the fact that they seem to have been brought about by changes in one of the non-living spheres first defined by Eduard Suess: Lithosphere, Hydrosphere and Atmosphere. Even a bolide impact can be considered an intervention from the outermost 'layer' the cosmosphere, which we define to be the extraatmospheric space environment of our planet. However, the present extinction seems to have a single dominant cause: Homo sapiens, i.e. a member of the biosphere. What determines the rate of the present extinction is the universal spread of the Homo sapiens and its ability to interfere with the other, non-living spheres. Interestingly, the first environmental disaster, and the first great extinction in the history of our globe was caused by organisms that produced oxygen. It too was an intra-spheral extinction event. It seems that the first extinction event on earth my well be another intraspheral event. Life, therefore, cannot only evolve, but also devolve itself out of existence. The only thing that can stop such a fate must be reason.

The Role of CcmG in C-type Cytochrome Maturation and the Evidence for Its Dual Function

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C-type cytochrome (cyt) maturation is a post-translational process by which heme cofactor is covalently attached to the conserved Cys-Xxx-Yyy-Cys-His motif of apocyt c to yield mature electron carrier, holocytochrome c. In R. capsulatus, numerous proteins are believed to play role in c-type cyt maturation including thio-oxidative proteins DsbA, DsbB and thio-reductive proteins, CcdA, CcmG and CcmH. While the thio-oxidative proteins introduce disulfide bonds into the conserved heme binding motif on the apocyt c, the thio-reductive proteins resolve them before the final heme attachment. We have previously shown that the c-type cyt deficiency of CcdA-null mutants can be bypassed by mutations in DsbA and DsbB. Here, we demonstrate that CcmG as well as CcdA, is not essential for c-type cyt maturation in the absence of DsbA and DsbB. The respective double and triple mutants of CcdA, CcmG and DsbA are able to grow photosynthetically on thiol-reactive reagents supplemented media. In addition, they can produce c-type cyts albeit at 10% of the wild-type levels consistent with their slow photosynthetic growth rates. Interestingly, CcmG without its active site cysteines can restore photosynthetic growth and c-type cyt production in the same mutants even in the absence supplementation suggesting a not yet defined activity of CcmG in addition to its thioredoxin function. However, CcmH didn't show the same interplay with DsbA/DsbB and we were unable to bypass the deficiency of CcmH indicating its essential role for the maturation. We discuss the role of CcmG in c-type cyt maturation and show evidence for its dual function.

Structural characterization of polyelectrolyte-protein coacervates

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Polyelectrolytes in the presence of oppositely charged small colloids may exhibit soluble complex formation or precipitation, but an intermediate state of hydration involves the formation of a macroion-rich second liquid phase. These dense, optically clear and often viscous coacervates exhibit unusual rheological and transport properties, in particular colloid translational diffusivities that are remarkably large given the large macroscopic viscosities. For coacervates of a protein (BSA) with polycations, dynamic light scattering and neutron scattering both provide evidence of mesophase separation on the scale of a few hundred nm, a phenomenon also consistent with the results from a number of other techniques (Cryo-TEM, rheology, FRAP, and DLS). Marked differences between protein-polyelectrolyte coacervates and micelle-polyelectrolyte coacervates correspond to different types of mesophases. In the case of polyelectrolyte-protein coacervates, coacervate properties and stability are strongly influenced when chitosan replaces PDADMAC, a synthetic polycation with the same structural charge density but smaller persistence length. For chitosan-BSA coacervates, SANS clearly indicated the presence of a fractal structure in the range $q<0.06$ (1/nm). Possible origins of mesophase structures will be discussed.

EcoNet: A New Software for Ecological Modeling, Simulation and Network Analysis

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A major reason contributing to the complexity of ecological systems is the inherent network structure with many interactions among multiple identities. Interactions are flow of energy, biomass, or a specific element; while the identities can range from accumulated organic matter to hundreds of species. A common way to simulate ecological models is to form a set of differential equations where the solution represents the state of each identity changing in time. A functioning model will provide insights as to how the real system works, how it can be controlled and manipulated. Another way to analyze ecological systems is by formulating system-wide organizational properties. Consider an ecological model where the state of each identity, and the flows among identities are relatively steady. A differential equation based simulation, since it only predicts future dynamic behavior of each individual identity, will not provide further insights as to how the environmental inputs are shared among identities, how much energy or matter cycling occurs within the system, or how strong are any two identities in the system related to each other. Obviously, such analysis is essential in understanding how a specific ecological system functions, how it can be sustained, or manipulated. Therefore we designed EcoNet (eco.engr.uga.edu), a simulation and analysis software for ecological systems. EcoNet integrates dynamic simulation capability with steady-state network analysis. Features like automatic diagram creation, capability to model large systems, stochastic simulation options, and a web interface that requires no installation make EcoNet a welcome addition to the ecological modeling world.

Factors Affecting in utero Retroviral Transduction Efficiency

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In utero gene therapy offers numerous advantages over adult gene therapy. These include a naïve immune system, the highly proliferative state of stem cell populations, high vector-to-cell ratio due to smaller size, and therapy prior to disease onset. We have transferred marker genes to various fetal sheep organs including liver, lung, brain, and thymus via retroviral (MMLV) vector supernatants. Additionally, we have demonstrated that the efficiency of gene transfer to these fetal organs appears to be dependent on gestational age. These studies showed that significantly higher levels of transduction/transgene expression occurred in the liver at earlier gestational ages, while the lung transduction efficiency correlated directly with recipient age. These results indicated that the developmental stage of the organ is important for transduction. We hypothesized that gestation-related alterations in the levels of the amphotropic receptor, PiT-2, used by the retrovirus for attachment and penetration were responsible for our observations. We generated an antibody to ovine PiT-2 and developed an ELISA to determine whether the age of each tissue impacts upon its levels of PiT-2 expression. We also developed a semi-quantitative RT-PCR assay to quantify the expression of PiT-2 at the mRNA level in liver and lung tissues at different gestational ages. Currently, we are designing sheep-specific primers for more efficient real-time Q-PCR assay as an additional means of quantifying the levels of PiT-2 gene expression. It is hoped that these ongoing studies will enable us to determine the optimal stages for gene delivery to each of the major fetal organs.

Branched Polyethyleneimine Coatings for Controlled Protein Adsorption and Biosensing Applications

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This study demonstrates the engineering of protein-resistant surfaces with controlled surface binding of biospecific recognition entities such as avidin-biotin. This was achieved by adsorption of branched polyethyleneimine (BPEI) on silicon substrates and further modification by covalent attachment of biotin for specific avidin attachment. Ellipsometry technique was used to monitor adsorption of polymer and protein layers on the surfaces. At low ionic strength, avidin adsorption was observed on poly(allylamine hydrochloride), poly(L-lysine) and branched and linear polyethyleneimine coated surfaces at basic pH values, in spite of the same positive electrostatic charge for protein globules and the surface. All these polymers were effective in suppression of avidin adsorption at pH 3 due to protonation of the avidin surface functional groups at this pH Though the net electrostatic repulsion between avidin molecules and BPEI was efficiently screened in a protein solution of pH 7 and 0.15 M NaCl, BPEI coatings of high molecular weight were unique in their ability to provide avidin-resistant surfaces due to steric hindrance from the branched architecture of adsorbed polymer chains. BPEI coated surfaces were also effective for suppression of smaller positively charged proteins such as lysozyme and ribonuclease A at pH 7 and 0.15 M NaCl, and they were also resistant to adsorption of negatively charged proteins such as BSA and fibrinogen at pH 7 and 0.75 M NaCl. Furthermore, BPEI coatings could be used for the immobilization of silver nanoparticles, which provides a promising application for label-free detection of biological species using surface-enhanced Raman spectroscopy (SERS).

Affect of Russian Wheat Aphid (*Diuraphis noxia*) Feeding on the Yield of Wheat (*Triticum aestivum L.*)

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The Russian wheat aphid (Diuraphis noxia (Mordvilko)) is a devastating pest of wheat (Triticum aestivum L.), barley (Hordeum vulgare L.), and other small grains and grasses in the High Plains region of the United States. Cumulative economic losses from Russian wheat aphid infestation in wheat and barley in the US have been estimated nearly at $1 billion since 1987. Nearly 60% of these losses have occurred in the Texas and Oklahoma Panhandles, northeastern Colorado, western Kansas, and southwestern Nebraska. Russian wheat aphid outbreaks frequently occur in this region resulting in significant damage and yield loss in wheat. For this reason, the objective of this study was to determine the yield loss due to Russian wheat aphid infestation in wheat growing under production wheat fields. A total of 10 fields (six fields in 2006, three fields in 2005, and one field in 2004) were sampled. The results showed that yield losses in wheat due to Russian wheat aphid infestation ranged from 61 to 84% when compared to uninfested wheat. Keywords: Yield loss, Russian wheat aphid, aphid infestation, wheat, barley

Limited Tolerance Towards the Periplasmic Protease DegP in the Absence of the Thiol:Disulfide Oxidoreductase DsbA

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In Gram negative bacteria, DsbA is a major dithiol: disulfide oxidoreductase that is involved in the formation of disulfide bonds during the oxidative protein folding in the periplasm. In the absence of DsbA, its substrate proteins lack their disulfide bonds, do not fold properly, and are degraded rapidly by periplasmic proteases. Rhodobacter capsulatus DsbA-null mutants are proficient in photosynthesis, but they exhibit severe pleiotropic phenotypes extending from motility defects to increased sensitivity to lysis and oxidative stresses. Remarkably, their respiratory growth abilities in enriched growth medium at 35ºC are also impaired, however, they can revert frequently to overcome this defect.

In this study, to gain insight into the molecular basis of this striking phenotype, a combined biochemical and genetic approach was used. The extracytoplasmic proteomes of R. capsulatus from a wild type, a DsbA-null mutant, and a DsbA-null revertant were examined using 2D-gel electrophoresis coupled to mass spectrometric identifications. Comparative analyses of the data indicated that most of the differentially expressed proteins in both DsbA-null mutant and in its revertant versus the wild-type strain shared a common profile. Among the several hundreds of protein spots tracked, only four exhibited an increase in the DsbA mutant, followed by a decrease to the wild type levels in the revertant strain. All of these four spots were identified by mass spectrometry to correspond to DegP. DegP is a periplasmic serine protease that is essential for the removal of misfolded proteins, which is a crucial process for cell survival. DegP acts as a protease as well as a chaperone depending on the growth conditions, with its protease and chaperone activities being more pronounced at higher and lower growth temperatures, respectively. Proteomic approach revealed that R.capsulatus DsbA-null mutants overproduce DegP, and consequently are temperature sensitive in enriched medium, demonstrating that overproduction of DegP is deleterious for the respiratory growth of DsbA-null mutants. On the other hand, genetic approach indicated that respiratory growth defect of DsbA-null mutant can be bypassed by decreasing, but not by completely abolishing the activity of DegP, as some DegP activity is needed in the absence of DsbA for cell survival.

Ornithine Lipid is Required for Optimal Steady-state Amounts of C-type Cytochromes in Rhodobacter capsulatus

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The c-type cytochromes are haemoproteins that are subunits or physiological partners of electron transport chain components, like the cytochrome bc1 complex or the cbb3-type cytochrome c oxidase. Their haem moieties are covalently attached to the corresponding apocytochromes via a complex posttranslational maturation process. During our studies of cytochrome biogenesis, we uncovered a novel class of mutants that are unable to produce ornithine lipid and that lack several c-type cytochromes. Molecular analyses of these mutants led us to the ornithine lipid biosynthesis genes of Rhodobacter capsulatus. Herein, we have characterized these mutants, and established the chemical structure of this non-phosphorus membrane lipid from R. capsulatus. Ornithine lipids are known to induce potent host immune responses, including B-lymphocyte mitogenicity, adjuvanticity and macrophage activation. Yet, despite their widespread occurrence in Eubacteria, and the diverse biological effects they elicit in mammals, their physiological role in bacterial cells remained hitherto poorly defined. Our findings now indicate that under certain bacterial growth conditions ornithine lipids are crucial for optimal steady-state amounts of some extracytoplasmic proteins, including several c-type cytochromes, and attribute them a novel and important biological function.

Nanostructured Solar Cells

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In this work we investigate the use of nanofabrication technique to improve the overall efficiency of silicon solar cells. The efficiency of silicon solar cells strongly depends on the quality of the anti-reflective coating. In this work, the change in the index of refraction on the surface of a substrate can be controlled by the amount of porosity, which is well known in effective medium theory. Also by changing the thickness of the porous layer, the medium can be fine tuned to a specific wavelength as an AR coating. We fabricate the nanoporous layer by using a self-assembled P(S-b-MMA) coating as a mask to etch into the silicon substrate using reactive ion etching. The use of different molecular weight diblock copolymer and different etching time allow us to tune the index of refraction. FT-IR and variable angle ellipsometry provide information about the transmission and reflection properties along with the index of refraction and the thickness of the coating. The investigation of the efficiencies are performed by comparing the I-V plots of conventional and nanostructured cells. Additional research is underway in order to apply this technology to other types of substrates. This work is supported by NSF grants DMR-0306951, DMI-0531171 and MRSEC.

Conflicting Identities and Outcomes among Foreign Workers in the U.S.A

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The topic of 'undocumented' workers is well known. Highly educated professionals find themselves in situations where they accept jobs in other countries, often with the intention of resettling there. Such employees are especially subject to job insecurity and job dissatisfaction, because of the uncertainty of their residency status and the experience both a new organizational culture and a new national culture. The topic of job dissatisfaction and job insecurity among local employees has also been well examined. However, almost no research has been done on the experience of foreign workers in a host country. There is little understanding of the social and workplace conditions that may impact their emotional states and performance. This study focuses on 'foreign workers,' who are defined as employees who have no permanent residential status in the host country and who seek overseas employment without sponsorship from any firm in their home nations. The study is based on a survey of U.S. employees with temporary visas, immigrant workers with permanent status, and U.S. born citizens. It examines the experience and attitudes of foreign workers and compares them to U.S. citizens. It has been shown that access to rich interpersonal networks provides an important coping device for deal with a variety of issues and problems in a person's life. This study looks at the extent of such networks and examines how these networks impact the employee's experience. It also looks at how the cultural value of individualism-collectivism relates to this process.

Integrating Content and Language: Thematic Health Unit in ESL Classroom

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This study explores the ways of incorporating content areas and language teaching; offers creative strategies and possibilities for integrating content into English Language teaching curriculum by providing development stages, and showcases a sample content integrated language syllabus on Health thematic unit. The aim of this study is to offer creative strategies for integrating content and language in bilingual classrooms through practical ideas on integrating skills. Since skills are used in integration in real life, it is difficult to separate them even in the language classrooms. In the segregated-skill approach, the skills are taught in a separate way. On the contrary, in integrated skills instruction, the concentration is on more than one skill at a time. One of the reasons for this concentration is to enable the students to use the language in everyday interaction, to help the students to transfer their knowledge, to make language learning an interesting and motivating process both for the students and the teacher, and to ensure that students will take an active role in their own learning process. Through thematic units, students learn about the subject by using the target language they are trying to learn, rather than their native language and they develop knowledge so that they develop their linguistic ability in the target language. It is thought to be a natural way of developing language ability and one that corresponds to the way we originally learn our first language. The study is designed to describe the place of language in content teaching and place of content in language teaching, and designed to present a sample language integrated content syllabus on health thematic unit, and a discussion of the practical classroom strategies that is based on content and language integrated learning in bilingual education.

Preferred and Actual Out-of-school Activities: A Comparative Case Study of Turkish Children

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Human learning and development can best be understood through their analyses in a variety of contexts. Studying children beyond school context provides a more complete picture of their development. Children's leisure time activities have a considerable impact on their physical, cognitive, social, and affective development. In this study, we looked at children's preferred and actual out-of-school activities by comparing our results to another study. In the spring of 2004, we surveyed elementary school students from two schools located in Istanbul regarding how they actually spend their after-school time. A nationwide study conducted by Turkish Radio and Television Supreme Council (RTUK) in 2006 investigated children's preferred leisure time activities. Our study asked 98 fourth graders what they usually do on Thursday and Friday after school, and all day Saturday. RTUK study collected children's activity data from 805 students between 7 and 10 years of age in 17 cities of Turkey. We found that children mostly spent their out-of-school time in play, watching TV, and reading, respectively. On the other hand, results from RTUK study indicated that children's most preferred activity was watching TV, followed by reading, and play. Our preliminary comparisons show that there is a noticeable difference between children's actual and preferred activity patterns. Preference and actual engagement in activities are shown to be distinct constructs as put forward by King et al. (2006). Disparity between actual and preferred activities substantiates the importance of social norms and cultural values in child reading practices.

Highlights of Preliminary Results from Turkish Participation of PISA in 2003

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PISA (Program for International Student Assessment) is a relatively new addition to the international comparative assessment arena. It has been administered since 2000 under the auspices of OECD. The program assesses how well 15 year-old students (10th graders) are prepared for the challenges of today's knowledge societies and their abilities to use their knowledge and skills to meet real-life challenges. Turkey participated in the program in 2003. Forty other countries representing one-third of the World's population took part in the program in the same year. The results are now available for secondary analysis. The outcomes of the program provide an opportunity to pursue important questions in Turkish educational policy in an international context. This study is an attempt to summarize highlights of the performance of Turkish 15 year-olds in PISA 2003, particularly in the domain of mathematics. We offer analysis of results from the cognitive section of the test for specific strands of mathematics curricula and how Turkish results are situated within the international continuum of student performances, not only in measures of average performance but also in the distribution of these scores. Findings are discussed by school type, regional differences as well as gender differences. We also look at results from student and school questionnaires visa vis equality of educational opportunity. This presentation is hoped to contribute to the growing and healthy line of discourse on Turkish education and educational policy.

Relative Efficiency of Turkish Textile Firms during 2001 Financial Crisis

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Intensely competitive markets and complex economic system drive managers to evaluate relative performance of their enterprises. Besides performance evaluation, use of limited resources in an efficient way carries high significance in productivity of their enterprises. In this respect, managers and researchers widely utilize Data Envelopment Analysis (DEA), which is a non-parametric method based on linear programming for evaluating relative efficiency of similar units, also known as Decision Making Units. Charnes, Cooper and Rhodes developed the DEA in 1978 mainly based on the concept of production frontier functions. This technique can monitor many inputs and outputs that cannot be transformed into single overall input or output. DEA is widely used in the measures of efficiency for a variety of production environments. This research compares the relative efficiency of Turkish textile firms during 2001 financial crisis in Turkey. Data from 20 firms quoted by Istanbul Stock Exchange (IMKB) were retrieved for the period of 2001-2002 and analyzed with DEA. Findings showed that seven firms in 2001 and twelve firms in 2002 were inefficient. Although effects of the crisis on Turkish financial markets and many sectors were instant, the impacts on the textile sector were delayed until 2002. Characteristics of the sector (e.g., annual production plans) were influential on this delay. However, low performance of the sector in year after the crisis highlights the lack of crisis management skills of Turkish textile firms, who could not make use of this time lag. Senior managers should have reacted proactively different from regular operational periods.

Impact of Ending Rules in Online Auctions: The Case of Yahoo.com

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This paper examines the impact of sellers' choice of auction parameters on the level of their revenues using data from Yahoo.com's Playstation 2 system auctions. Our study specifically highlights the impact of the ending rule. We introduce a new variable called Winning Bid Ratio (WBR), and use it as a proxy for seller revenues. WBR is the ratio of the winning bid of an auction to the buy price offered by the seller. We find that choosing a high bid increment and including a shipping price decreases the WBR. Alternatively, lower number of bids and choosing a shorter auction length have a positive effect on the WBR. On the whole, the ending rule has a negative effect on the WBR, which is in accord with the theoretical predictions in the literature. However, we also find variations in the results for the effect of ending rule when we divide the data into two groups consisting of high and low-value auctions.

The role of Religion, Culture, Media, and Democracy in American Public Schools: Making Connections through Teaching Philosophies and Teacher Knowledge Research

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Over the past twenty-five years a research movement has emerged that seeks to bridge the gap between educational theory and practice by taking seriously the intellectual dimension of the practical work of teaching. This work includes, but is not limited to, research on teachers' practical knowledge, craft knowledge, personal practical knowledge, and wisdom of practice, as well as teacher research, action research, and the scholarship of teaching. Education is situated in the sociocultural and historical context. In this study, I will take at the situation of religion, culture and media in American public schools over time. What does the Constitution say? What has that meant in the past? Does it mean the same thing now? What is constitutionally required? What is constitutionally forbidden? What is pedagogically sound? What should be taught about religion? Teachers are often scared or discouraged to broach religion often stating they wish for religion to remain outside of the classrooms. In reality, religion is already present in our public schools: in the beliefs and practices of teachers, administrators and students and in the vocabulary of some educational materials. The final collaborative multimedia learning object based on the research will be shared on a website (http://mnyildiz.googlepages.com/rr) in order to provide creative ideas and strategies and web based teaching resources and tools for teacher candidates. To date, scholarly studies have investigated the impact of multicultural perspectives in educational setting, few studies looked at the role of educational issues in teacher candidates' educational philosophies. This study attempts to fill the gap by outlining the natural links between multicultural education and educational philosophy/theory.

European Union's Enlargement Period: "Peace and Welfare" *

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The European Union (EU) is a community composed of most of the countries of Europe, which was destroyed during the Second World War, and founded to reestablish the peace, the regional stability and economical reconstruction. EU mainly is an organization of international relations rather than economical values. The enlargement of EU is a very good opportunity for the new members, in the sense that it is going to give a level of stability and affluence to the new member and cause Europe to become a united whole and take a turn for the better. This enlargement period of the EU, when population, member countries, cultural varieties are taken into consideration, is qualified as a perfect accelerate. Third party countries will make the most of the EU's enlargement. In this paper, the period of the EU's enlargement is analyzed and evaluated.

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A Diathesis-Stress Model of Preadolescent Depression: Perceived Control and Attachment in Relation to Depressive Symptoms

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We longitudinally tested the diathesis-stress model of depression with low perceived control and insecure attachment as vulnerability factors that increase preadolescents' risk for depression in the presence of uncontrollable life stressors. Two hundred and eight low income preadolescents in 5th and 6th grade were followed up into 7th and 8th grade. The final sample consisted of 100 participants (48 females, 22% African American, 36% White, 11% Hispanic or Latino, 16% mixed ethnicity and 15% other ethnicity). At Time 1, measures included the Nowicki–Strickland Locus of Control Scale and a revised version of the Inventory of Parent and Peer Attachment (Armsden & Greenberg, 1987). Depressive symptoms and life stressors were assessed at Times 1 and 2, using the Child Depression Inventory (Kovaks & Becki, 1977) and Negative Life Events Check List (Johnson & McCutcheon, 1980), respectively. The latter included only items assessing uncontrollable life stressors. Hierarchical multiple regression was conducted to test the interactive effects of each vulnerability factor with life stressors (low perceived control x life stressors and attachment security x life stressors) on Time 2 depression, controlling for gender, Time 1 depression, and Time 1 uncontrollable negative life events. Results confirmed the expected interactive effects of low perceived control and uncontrollable life stressors on depression ($F(8, 91) = 4.310$, $p < .001$). However, although attachment security was a risk factor for depression ($F(6, 93) = 4.085$, $p < .01$), its interactive effect with life stressors was not significant.

European Health Action in Preventive Health: Impacts on EU Role and Direction

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The focus on assessment and prevention of communicable diseases is not a new trend in the field of public health. There is however a new global trend in which governments act more inclusive of disease prevention and emergency health preparedness in their political discourse and legislation. The growing role of the European Union in the field of preventive public health is interesting because the EU has not completed its institutional development as a government. The system of regional governance called the 'European Union' presents a multifaceted case for those interested in studying the political and social impact of this global actor. A study of health policymaking in the EU will uncover a wide range of challenges pertinent to the nature and the direction of the Union, namely institutional building, constitutional set-up, governance and sustainable development. The precautionary principle, adopted in 2000 by the European Commission, marks an important direction in EU competences. Additionally, the adoption of the principle has had an impact on environmental policies, EU food law, consumer protection, trade, research and technological development. The Avian Influenza is one of the recent and most urgent pandemics that presents the EU with a case for stronger regulatory intervention.

Educational Research on How Young Students Make Sense of Variability in Probability Situations: "Why is the distribution shaped this way?"

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Stochastic ideas and intuitions are widely used in almost every field of our lives when we make decisions under uncertainty. Central to these ideas are to understand the role of chance variability and to explain and interpret the variability in data. To address the interplay between data and chance topics starting from the elementary grades, I conducted a small-group teaching experiment focusing on the ideas of probability and distribution with fourth-grade students. The goal was to investigate students' development of probability concepts through reasoning about distributions using chance devices and simulations. This poster presentation will discuss findings on a particular task in which students modeled random rabbit hops by tossing a coin with known probability of ½ to determine where the rabbit would be after five hops in repeated trials. To understand the shape of this binomial distribution, students generated inscriptions of "paths" showing the possible ways to get an outcome to reason about the number of ways. To extend the discussion of students' reasoning about why the distribution has a middle clump and their understanding of the probability of outcomes, I will also present data from an ongoing research with middle school students by focusing on their use of probability modeling software integrated in TinkerPlots (Konold & Miller, 2005) to support their arguments by using a technology tool. The poster will be presented together with computer simulations and video clips of students that will be shown from the presenter's laptop computer.

Interorganizational Response to Catastrophic Disasters: Hurricane Katrina in 2005

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Intergovernmental relations coordinating complex systems in emergency management were unsuccessful during Hurricane Katrina. Identifying those intergovernmental relationships that occur during emergency responses became imperative. This research applies a theoretical framework of networks in disaster response using Hurricane Katrina operations as example; and will compare a successful network response using Florida's response to 2004 hurricanes as example. This study will utilize data from content analyses of news reports from New York Times, situation reports from the Federal Emergency Management Agency (FEMA), situation reports from Florida Mississippi Alabama states emergency management agencies, situation reports from American Red Cross and situation reports from City of New Orleans. Data collected from content analyses will be analyzed using the UCINET 6.0 social network analysis program. UCINET is a comprehensive program for the analysis of social networks, which con¬tains several network analytic routines and general statistical and multi¬variate analysis tools. The importance of this research lies in establishing a comprehensive understanding of these network dynamics, which in turn will enable policy making and management techniques to evolve appropriately. This research will identify a theoretical framework supporting the use of networks, partnerships, and collaborations in intergovernmental relations in a disaster response mechanism. Further, this study will identify a network performance in response operations. By establishing a model of a high-performing disaster response network, this research will inform both theoreticians and practitioners.

"Interstate Partnerships in Emergency Management: Emergency Management Assistance Compact (EMAC) in Response to Catastrophic Disasters"

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This study shows how loosely coupled networks are energized to act in response to disasters. The Emergency Management Assistance Compact (EMAC) is a mutual aid agreement and partnership between states that allows states to assist one another in responding to natural and man-made disasters. The assistance is often in advance of federal disaster assistance. This paper studies EMAC's response to the catastrophic disasters Hurricanes Katrina and Rita in order to address the significant need for state level analysis of emergency management. A content analysis of news, documents, and reports from a number of institutions was performed to determine the volume and direction of EMAC's performance and its transactions during its duties. A major finding was the extreme lack of current EMAC training taken by responders, reducing communication and coordination, and potentially, efficiency and effectiveness. A network analysis using the NEMA/EMAC 2005 Hurricane After-Action Report and the UCINET social network analysis program assessed the relationships among the organizations required to coordinate action the emergency response operations. The horizontal partnership formation among states solving common problems, such as dealing with disasters, presents new challenges for state public administrators and is the subject of future study. Keywords: networks, EMAC, emergency management, UCINET, interstate cooperation, horizontal relationships, partnerships

Effect of Mood on Metamemory

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This study explored whether mood, and more specifically mood congruency, affects feeling-of-knowing judgments and thus metamemory. Participants were induced into a depressed or happy mood through music and memory elicitation and then asked to recall pleasant or unpleasant items using their general knowledge. All participants, regardless of induced mood type, recalled more pleasant items, thus showing results more consistent with the ideas of mood repair and mood maintenance (e.g., Isen, 1985) than the mood congruency effect. Moreover, paralleling the semantic memory performance, differences in feeling of knowing ratings given when recall failed were also consistent with the idea of mood repair, thus showing for the first time that mood can affect metamemory performance, as well. However, in a subsequent perceptual identification task, participants induced into a depressed mood identified more of the unpleasant items they had not initially recalled but instead given high feeling-of-knowing ratings to, showing that implicit memory was influenced by mood congruency.

A Cross-Disciplinary Graduate Degree Concentration in Nanotechnology at Stevens Institute of Technology

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To support the vision of research growth and excellence at Stevens Institute of Technology (Hoboken, NJ), several multidisciplinary research focus areas with nanotechnology as a critical enabler have been developed or are emerging within the broad theme of Multi-Scale Engineering & Science at Stevens. These areas include Chemical and Biological Micro-Systems; Multi-Scale Design, Fabrication, and Manufacturing of Complex Structures and Composites; Controlled Release and Regenerative Medicine; Cell-Cell and Cell-Material Interactions; Nanoparticulates for Environmental Remediation; Quantum Electronic Structures and Devices; Nano- and Micro-Electrical-Mechanical Systems (NEMS/MEMS), and Nano-Photonic Sensing and Imagining.

To support this rapidly growing research base and PhD student population working in the area of nanotechnology at Stevens, the Nanotechnology Graduate Program was co-founded by five academic programs spanning the School of Engineering (Departments of Chemical, Biomedical, and Materials Engineering; Civil, Environmental, and Ocean Engineering; and Mechanical Engineering) and the School of Sciences and Arts (Departments of Chemistry and Chemical Biology and Physics and Engineering Physics). The mission of the Nanotechnology Graduate Program is to equip our graduate students (doctoral students in particular) with the multidisciplinary intellectual capacity necessary to lead the creation of new discoveries in nanotechnology while preserving strong disciplinary fundamentals of the students home program. The Program aims to provide students, via common core courses and a range of technical electives, with the following attributes:
(1) The understanding of nanoscale phenomena and the familiarity with the techniques for characterization and measurements of structures and properties;
(2) The knowledge for synthesis, processing, and manufacturing of nano structures, nanocomponents, as well as multiscale systems with nano building blocks for applications ranging from life sciences to engineering;
(3) The ability to design, analyze and simulate nanostructures, nanocomponents, and nanodevices for various applications;
(4) The ability to excel in a multidisciplinary environment, to critically/creatively think, and to seize and develop commercial opportunities in the fast-advancing nanotechnology field.

Candidates for Ph.D. degrees with the nanotechnology concentration must satisfy disciplinary core requirements, must complete the common core and a minimum of five approved elective courses, and must regularly attend the nanotechnology seminar series in the Nanotechnology Curriculum. In addition, a Ph.D. candidate must successfully execute a doctoral dissertation in the realm of nanotechnology within their home department. Applications are processed and decisions are made in individual's home department, and normal disciplinary admissions standards apply. Students can also pursue an Interdisciplinary Graduate Degree with a concentration in Nanotechnology via the appropriate channels.

National Institutes of Health, National Heart Lung and Blood Institute

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Interventional MRI and the iMRI Device Fabrication Lab

Fundamental to the success and safety of any interventional procedure is real time visualization of the invasive tools with high resolution. Conventionally, this is achieved with fluoroscopy. However, fluoroscopy is associated with potentially significant doses of radiation for both patient and medical staff. Therefore Magnetic Resonance Imaging (MRI) is an important alternative that provides the viewing of soft tissue at high contrast and provides a diagnostic tool that detects pathological differences without using ionizing radiation for performing interventional procedures. Interventional MRI seeks to expand the applications of MRI modality to include minimally invasive procedures to remedy conditions that may normally have required open surgery. With the development of real-time MRI and active devices, an interventionalist can easily see his instrument's advancement through tissue in the 2-D slices or 3-D reconstructions obtained from scanning. Examples of successful experimental studies achieved under MRI include the catheter delivery of atrial septal defect occluders, percutaneous dilatation (PTA), stent and vena cava filter placement, Transjugular Intrahepatic Portosystemic Shunt (TIPS) procedures, and aneurysm treatment, have been performed and stents.

The visualization of interventional devices such as catheters and guidewires under MRI require RF receiver coils incorporated into the distal tip of the instruments. In a MRI image, signal intensity will be high around the coil, so tracking of the instrument's tip through soft tissue structures such as blood vessels can be easily monitored. The iMRI Device Fabrication Lab mainly focuses on the challenge of building such "active" devices that are compatible with MRI (i.e. no ferromagnetic material). In addition to incorporating a resonant circuit within the device, consideration must be given to design that will reduce risk of heating as well as not compromise the device's features such as torque ability, flexibility, and low profile – factors that are critical for a successful implementation in vivo. The iMRI Dvice Fabrication lab's capabilities consist of laser welding, heat shrink jacketing over medical tubes, fuse welding, balloon forming, dip coating, UV curing and annealing metals for shape memory.

Laboratory of Cardiac Energetics, NHLBI-NIH

Merdim Sönmez

The major goal of the Laboratory is a better understanding of the complex physiology of the cardiovascular system. Towards this goal, the Laboratory specializes in the use of non-invasive technologies to follow physiological processes in man and model systems. The Laboratory also has a very active clinical program evaluating the use of magnetic resonance imaging in the diagnosis of cardiovascular disease. Current studies are:

Automatic Multimodality Image Registration:

Multimodality image registration is essential to combine strength of different modalities to increase quality of guidance during clinical surgery and therapy. There are different types of registration approaches, some of which rely on external fiducial markers, some of which are intensity-based or feature-based. The purpose of this study is to automize registration process of X-ray fused MRI (XFM) system. XFM is a system which provides visual-guidance to surgeon with MRI images during live case X-ray operation. Registration of two types of image modalities is based on external fiducial markers which are attached to the subject's skin. In this study, we developed 2 methods to detect external fiducial markers in two different environments. To detect fiducial markers in MRI we used 3D MR images. We acquired 3D image from MRI scanner. Maximum intensity projections (MIP) are calculated for transverse, sagittal and coronal view, then segmentation and edge detection algorithms were applied. Different than MRI, we reconstruct 3D location of fiducial markers in X-ray using multiple X-ray views. Basically, segmentation and edge detection algorithms were applied to detect markers. Since these are 2D images in some angels markers are overlapped, we solved this problem using other views to estimate position of overlapped markers. Once we have 3D locations of markers both in MRI and X-ray environments we applied registration algorithm which is based on least square minimization algorithm.

Real-Time Balanced Steady State Free Precession Imaging With Through-Plane:

The production of MR scanner hardware with better gradient performance has enabled a range of balanced steady state free precession (bSSFP) imaging sequences with fast repetition times (TR) such as TrueFISP, FIESTA, balanced FFE, etc. These steady state imaging methods are now being utilized in a variety of clinical applications some of which require special sequence customization. Also an other challenging issue in real-time flow encoding sequences is the design of optimal gradients that generate needed Velocity Encoding Constant (VENC) to measure the Velocity without aliasing in the direction of the flow. In this research, we concentrate on to combine the bSSFP-based fast anatomical real-time imaging with modifications described by Markl et al [1] yielding additional through-plane flow information. This flow data comes with a minor reduction in the speed of anatomic imaging depending on the required velocity encoding (VENC).

Reference Articles:

1-Markl M., M. T. Alley, N. J. Pelc, "Balanced Phase-Contrast Steady State Free Precession (PC-SSFP): A Novel Technique for Velocity Encoding By Gradient Inversion.", Magn Reson Med, (2003) 49:945-952

Dual-Degree Cooperation between the Turkish University System and Binghamton University – State University of New York

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The purpose of this presentation is to introduce the Dual-Diploma Programs that represents a unique academic cooperation between major Turkish universities and Binghamton University of the SUNY system. Binghamton University and four Turkish universities (Bogazici, ITU, ODTU, and Bilkent) have recently inaugurated a pair of innovative dual-diploma baccalaureate programs. Turkish undergraduate students majoring in Global and International Affairs, Information Systems, and Management complete half of their degree requirements at Turkish universities and half their degree requirements at Binghamton University. The aim of the dual-diploma programs is to provide enrollees with a unique, rigorous, bi-cultural learning experience leading to the receipt of a high-value dual-diploma degree from a pair of well-respected research universities. Admission to the Dual-Diploma Program takes place in Turkey according to the standard undergraduate university admissions procedures of the Turkish Council of Higher Education (YÖK) and the admission criteria of Binghamton University. Participants spend their freshman and junior years at Turkish Universities and sophomore and senior years at Binghamton University. This program is the first of its kind between Turkey and another country. Currently, there are 382 Turkish students participating in this program. This unique and innovative program provides Turkish students with the opportunity to:

- Earn a high-value undergraduate degree from a leading Turkish university and a major American research university
- Receive the innumerable benefits of an extended bicultural living and learning experience.
- Develop superior English language skills
- Prepare for graduate study at the best universities in Turkey, the United States or other countries

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National Science Foundation and Bioengineering Funding Opportunities

Dr. Demir will present (1) the vision, mission, strategic goals and core strategies of NSF, (2) NSF's current priority areas, (3) a summary of different NSF Funding Opportunities for engineering and bioengineering, and (4) NSF Merit Review Criteria.

ABOUT TASSA

The Turkish-American Scientists and Scholars Association (TASSA) is an independent, non-profit and non-political organization promoting educational and scientific cooperation between the USA and Turkey. Established in June 2004 in Washington, D.C., it aims to facilitate the advancement of science in Turkey and the USA through scientific exchange and educational programs and increased networking.

VISION

TASSA's vision is to build a sustainable science bridge between the U.S. and Turkey. This bridge would facilitate the flow of people (scientists and scholars), knowledge, and technology and help link science and technology institutions in the two countries. TASSA will accomplish its vision by:

- Exchanges of scientists
- Facilitating joint research projects and joint publications with scientists based in Turkey
- Facilitating sabbaticals
- Establishing a "Science Corps" for voluntary short-term assignments
- Forming networks of scientists based in the U.S. and Turkey in various disciplines
- Twinning of U.S. and Turkish scientific and academic institutions
- Facilitating the sharing of best practices among science institutions.

The building of a science bridge requires strong "legs" on both sides of the Atlantic. Thus, as a matter of priority, TASSA is strengthening its own internal organization, expanding its membership, and developing directories of people and institutions, in both Turkey and the US.

ACTIVITIES AND PROGRAMS

During its short existence TASSA has held its first annual conference, developed a Web site, started its first program, and completed its organization.

The Visiting Scholars Program

This first program launched by TASSA aims to promote communication and cooperation between TASSA members in the US and their counterparts in Turkey. It helps match TASSA members planning to visit Turkey and are willing to share their research activities and experience with their colleagues in Turkey with Turkish universities or other institutions expressing interest in the research area of the visiting TASSA member. A database of potential host institutions in Turkey has been developed, as well as online application forms for those interested to serve as visiting scholars, or to host them in Turkey. TASSA members wishing to serve as visiting scholars can join the program through the TASSA Web site and Turkish institutions wishing to host such scholars can express their interest through an email addressed to: visitingscholars@tassausa.org.

ORGANIZATION AND MEMBERSHIP

TASSA is governed by a Board of Directors, whose members are elected for two-year terms by the dues-paying members. The Board's Executive Committee serves as the principal administrative and managerial oversight body within TASSA, led by the TASSA President and President-Elect. TASSA's operations are managed by the Executive Director. In addition, several standing and ad hoc committees facilitate the operations of the organization. Three of these have played significant roles in the establishment and "take off" of TASSA: the Elections and Bylaws Committee, the Web Development Committee, and the Annual Conference Committee. TASSA's members are scientists and scholars in the fields of:

- Social sciences, arts and humanities
- Health & biomedical sciences
- Engineering & applied sciences
- Natural sciences.

For more information please visit: www.tassausa.org - For inquiries send message to: info@tassausa.org

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BICOM

İzmir Ekonomi Üniversitesi Geleceği Yönetmek...

Welcome reception. (from left) Cengizhan Öztürk, Süleyman Gökoğlu and H.E. Nabi Şensoy

Süleyman Gökoğlu, Serap Aksoy and H.E. Nabi Şensoy

A scene from lunch at the Yale Law School Dining Hall

A scene from the registration desk

A scene from the gala event at
the **Yale Peabody Natural History Museum**


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