Visitor Program

intelligent technologies to empower mankind

Seminars

Research

Tokyo Institute of Technology (Principal Investigator: Shri Narayanan) February 19 – February 22, 2013. Professors Sadaoki Furui and Keisuke Yamada and seven students from the Tokyo Institute of Technology visited USC as a part of Tokyo Tech's Global Leadership Program. During their visit, the Tokyo group attended USC lectures and participated in discussions for specific themes and projects, which included discussions and presentations by both the Tokyo group and USC faculty and students. Tokyo Tech expressed having a successful visit and is looking forward to future collaborations with USC.

Andrea Gasparri, Assistant Professor, Roma Tre University, Italy (Principal Investigator: Bhaskar Krishnamachari) June 2013. Dr. Gasparri is a young expert with rapidly growing recognition in the emerging area of distributed networked robotics, a field at the intersection of control, robotics, and networking that is currently gaining in importance. During his visit, he presented at three seminars and collaborated with faculty in network controls.

Erik Ström,
Professor, Chalmers University. (Principal Investigator: Ubli Mitra) June - August 2013. Professor Ström is a highly respected communications theorist at Chalmers University. He visited USC to collaborate with faculty advancing the state-of-the-art in transportation related research and in the networking area who have been actively studying vehicular ad hoc networks (VANETs), as well as control system theory for transportation systems.

Professors Shamgar Gurevich and Alexander Fish, University of Wisconsin (Principal Investigator: Urbashi Mitra) February 5-9, 2013. Professors Gurevich and Fish's visit presented an opportunity for Professor Mitra and her group members to interact with excellent mathematicians from a top institution. The University of Wisconsin, Madison's Mathematics department was ranked in the top ten in the 2011 National Research Council rankings. Their objective is to finalize a journal paper and investigate future avenues for collaboration.

MHI provided resources for leading researchers to visit USC to collaborate with faculty and students, which is essential to help define and contextualize the right set of research questions for specific domains.

MHI continues to provide support for innovative seminar series that show continued success by positive attendance and collaborations. These series target high quality academia and industry speakers that present the latest ground breaking research in their related field.

CommNets Seminar Series (Principal Investigators: Rahul Jain) Spring 2011 - present. CommNets is a weekly seminar that brings together faculty and students in communications, networks and controls with common interests. One of the goals is to expose students in various areas to work in other areas. The seminars, still open to all, have been very well-attended over the course of the last year.

Integrated Systems Seminar Series (Principal Investigator: Hossein Hashemi) Spring 2011 - present. This series targets academia and industry speakers in integrated systems, circuits, and devices, with a wide range of applications including communication, computation, networking, sensing, and imaging. The 2012-13 Integrated Systems Seminar Series brought in 20 prominent academic researchers and industrial leaders to USC to give talks and interact with faculty and Ph.D. students. Most talks were well attended by faculty, post-doctoral scholars, and graduate students. Interactions with the invited speakers led to a few research collaborations with groups at USC and career opportunities for USC graduate students and post-doctoral scholars. Specific examples include the initiation of collaborative effort between WiSpry and Prof. Hashemi's research group towards realization of reconfigurable wireless front-end modules utilizing WiSpry RF-MEMS technology (Visit and talk by WiSpry CTO, Dr. Arthur Morris), and continued collaboration between Prof. Molnar's group at Cornell and Prof. Chen's group at USC (Visit and talk by Prof. Alyosha Molnar from Cornell).

Medical Imaging Seminar Series (Principal Investigators: Krishna Nayak, Richard Leahy, Justin Haldar and Houchun Hu) Spring 2012 - present. Krishna Nayak started the seminar series as a 1-unit course, seminar EE 598, that nineteen graduate students registered for. Attendance varied from 25 to 50+ and included discussions and reports from student attendees.

Quantum Information Seminar Series (Principal Investigators: Daniel Lidar, Todd Brun and Ben Reichardt) Spring 2012 - present . The USC Quantum Information Seminar Series hosts speakers from around the world presenting the latest ground breaking research in quantum information theory and experiments. Quantum information seminars are co-hosted weekly with the condensed matter physics group, to promote interactions at the intersection of both of these lively fields.

Ph.D. Student Seminar Series (Developed by the 2012-2013 MHI Ph.D. Scholars) Fall 2012 - present. The Ph.D. Student Seminar Series is aimed at improving interaction and fostering a tight-knit community among EE Ph.D. students. The ultimate goal is to establish new student-level collaborations among different research groups in the department. Ph.D. Students will benefit by giving talks to a broad audience which train them for job interviews, qualifying exams, and other research talks. This seminar provides an informal environment where presenters will give a 20 minute talk about their research topics and gain feedback from their fellow students.
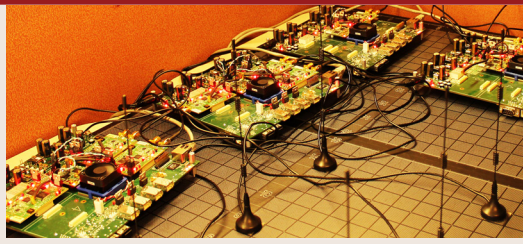
Large-Scale Software Radio Testbed
Principal Investigators: K. Psounis, G. Caire, A. Molisch, M. Chen, H. Hashemi Co-PIs: A. Dimakis, R. Govindan, R. Jain, B. Krishnamachari, J. Kuo, T. Levi, U. Mitra, A. Ortega
Duration: 5/2011-10/2013

The Large-Scale Software-Radio Testbed aims to build one of the best software radio testbeds in the world at USC. Faculty in the EE department proposed four multidisciplinary projects that began as soon as the first radios arrived and have committed a number of Ph.D. students towards practical research. Two of those projects, namely, creating a distributed multiuser MIMO system from distinct base stations and demonstrating a massive multi-user MIMO system, have produced important results. Postdoctoral scholar, Marcelo Segura was hired to assist with this research from 10/1/2012-10/1/2013. These test-beds are available to all the researchers at USC. Konstantinos Psounis and Giuseppe Caire have filled two patent applications with the USC licensing Office. Konstantinos Psounis and Giuseppe Caire have founded a startup company, SpaceMUX, Inc., with the help of the USC Stevens Institute of Innovation.


The MHI Driving Simulator
Principal Investigator: Petros Ioannou
Duration: 11/2012-11/2013
The MHI Driving Simulator (DriveSafety DS-100) is located in the Center for Advanced Transportation Technologies Laboratory. The research team conducts the simulator validation study to evaluate perception of the environment between a real car environment and that of the simulator. This validation process is essential in order to draw more reliable conclusions when using the simulator to test different driving concepts. After validation they plan to test a driver/vehicle diagnostics system applied to vehicle following and lane change tasks during dangerous situations that cannot be test in an actual vehicle due to safety considerations. These tests will help researchers evaluate the effectiveness of the system in using it to provide warnings or assistance to the driver in real driving environments. The associated Human-machine interface perception and human factors evaluation studies will be performed using the simulator. Currently, the researchers are preparing a paper on the simulator validation, which is a key milestone before the simulator can be effectively applied for the research purpose. The paper will contain new validation techniques for particular driving task.

Events

9/28/12
Engineering and Autism: A national workshop
MHI Director Shri Narayanan organized the NSF Expedition Meeting and Workshop at USC. The workshop highlighted possibilities of engineering and computing advances to support research in Autism by creating synergies and initiating dialog. The broader community of stakeholders including families, as well as researchers and clinicians were part of the 200 guests that attended the workshop. *Sponsored and hosted by MHI and the Center for Behavior Imaging of GIT and CARE. View presentations and other workshop affiliates on mhi.usc.edu*

Annual Electrical Engineering Retreat
The department retreat was developed by MHI to bring faculty and Ph.D. students together in a social environment to receive department updates, discuss research accomplishments and collaborate on defining the future of electrical engineering at USC and beyond. 183 guests attended the 2nd Annual Retreat.

10/27 -28/12

2/6/13
Annual Electrical Engineering Research Festival
MHI developed this day-long event to showcase department and student research through poster sessions, demonstrations, oral presentations and panel sessions. The entire USC Viterbi Community, alumni and visitors from industry are invited to attend the event and collaborate with our remarkable students and faculty. Participation has increased each year. Save the Date for the 4th Annual EE Research Festival - **October 11, 2013**
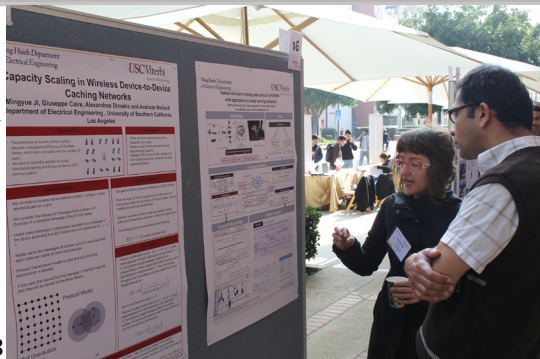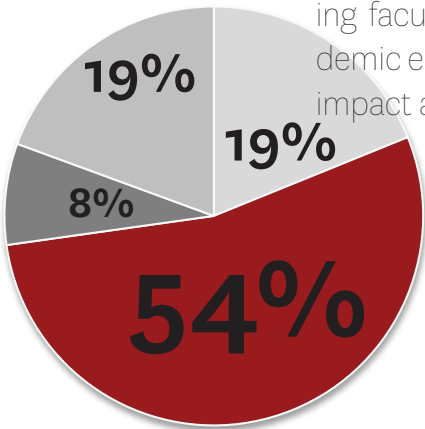

Alumni Bay Area Reception
Staying connected with electrical engineering alums is one of MHI's main goals to continue enhancing innovation and excellence. Over 50 alums attended the San Jose networking event to re-connect with former classmates and meet local alums with the possibility for future collaboration. There was good conversation about the latest alumni accomplishments as well as exciting activities and research happening in the department.

6/13/13

Established in 2010, The Ming Hsieh Institute (MHI) is a **research institute** focused on enhancing academic and research programs in the Ming Hsieh Department of Electrical Engineering. Through supporting innovative activities and hosting top research visitors, MHI positions the department at the forefront and provides leadership in the study of emerging fields within electrical engineering. Sponsorship is aimed to support programmatic activities that broadly benefit electrical engineering faculty and students, build an energetic academic environment and increase the department's impact and visibility.

MHI support includes:

19%

19%

8%

54%

8% Scholar Program: award, travel funding, workshop and event support

19% Visitor Program & Seminars: support for leading researchers from around the world to visit USC to give talks and collaborate with electrical engineering faculty and students

19% Annual Department Events: developed, organized and hosted by MHI with the objective to encourage faculty, student and alumni collaboration to initiate remarkable research

**54%** Research: supported research projects and workshops initated by EE faculty

"If you look at what the graduate and undergraduate students are demonstrating today, there is absolutely no doubt that what we have is one of the top departments in the country, and we have some of the best minds and best faculty conducting this research"

Asad Madni, USC EE Advisory Board at the 3rd Annual Research Festival

cover image 3rd Annual Electrical Engineering Research Festival hosted by MHI

SCHOLARS
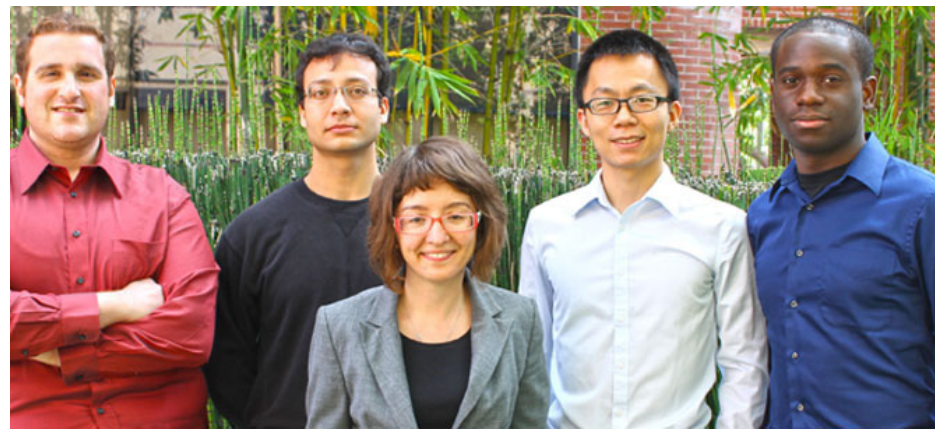
Each year, a select group of top Ph.D. students from the Electrical Engineering Department are selected as **Ming Hsieh Institute Ph.D. Scholars.** This set of students is chosen carefully by a faculty committee on the basis of their research accomplishments and desire for an academic career beyond the Ph.D. MHI Ph.D. Scholars are considered the top students in the department and prove to be leaders.

- The 2012/13 Scholars developed the Ph.D. Student Seminar Series

- Past Scholar Samir Sharma used his travel funding to give a talk at the University of Wisconsin, where he is now a Research Associate

- Former MHI scholars-turned faculty members Firooz Aflatouni, Prasanta Kumar Ghosh and Chuan Wang are all working on exciting research. July 2013 news announced Wang creates the first user-interactive sensor network on flexible plastic

MHI Ph.D. Scholars
Moh Amer
Kartik Audhkhasi
Hao Huang
Osonde Osoba
Daphney-Stavroula Zois

MHI Leadership
Shri Narayanan, Director
Hossein Hashemi, Co-Director
Bhaskar Krishnamachari, Co-Director
Marcelo Segura, Postdoctoral Scholar
Danielle Hamra, Business Manager

Faculty Advisory Council
Murali Annavaram
Martin Gundersen
Petros Ioannou
Richard Leahy
Urbashi Mitra
Michelle Povinelli
Viktor Prasanna

To foster creativity and invention within all facets of USC's electrical engineering including research and education

To define the future of electrical engineering, enhancing its positive impact on all spheres of human endeavor

To create a vibrant intellectual environment at USC where world-class researchers in electrical engineering and related fields can come together and engage in the development of new ideas

mhi.usc.edu

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Ming Hsieh Institute
intelligent technologies to empower mankind

Annual Report 2012/2013

USC Viterbi
School of Engineering
Ming Hsieh Department of Electrical Engineering

USC University of Southern California