Ming Hsieh Institute Suite

In the Spring of 2014, the Ming Hsieh Institute found a new home on the first floor of the Hughes Aircraft Electrical Engineering Building (EEB). Newly renovated for the Institute, Suite 131 features 4 visiting professor office spaces, a conference room, a kitchen and lounge area where faculty and guests are encouraged to come together to socialize and engage in the development of ground breaking ideas. Located just next to the MHI offices is the Ming Hsieh Department Seminar Room. This Seminar Room seats 75 and since its opening has been used to host a variety of seminars, workshops, and events.

MHI Leadership

Shri Narayanan, Director
Hossein Hashemi, Co-Director
Bhaskar Krishnamachari, Co-Director
Marcelo Sergura, Research Associate
Elise Herrera-Green, Business Administrator

2013-2014 Faculty Advisory Council
Murali Annaravaram
Giuseppe Carre
Stephen Cronin
Mahta Moghaddam
Krishna Nayak
Antonio Ortega
Massoud Pedram

Ming Hsieh Institute
Department of Electrical Engineering
USC Viterbi School of Engineering
3450 McClintock Ave., EEB 131, Los Angeles, CA 90089 | p: 213-740-2154 | e: info-mhi@ee.usc.edu
mhi.usc.edu

MHI Scholars also worked on fostering a tight knit community of EE Ph.D. Students by hosting a Spring BBQ (4/17/14)

MHI Scholar Harsha Honnappa traveled to Northwestern University to deliver a talk, and will begin a faculty position at Purdue University in the Spring of 2015.

Sergul Aydore gave a talk at the Organization for Human Brain Mapping 2014 Annual Meeting.

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 carefully selected by a faculty committee on the basis of their research accomplishments and desire for an academic career beyond the Ph.D. During their year as MHI Ph.D. Scholars, these students receive mentorship and guidance towards helping them achieve a career in academia.

MHI Scholar Harsha Honnappa

Ming Hsieh Institute Scholars

2013-2014 MHI Ph.D. Scholars, from top left: Yanzhi Wang, Harsha Honnappa, Mohammad Reza Chitgarha, Yuchi Che, Sergul Aydore, Saeid Jafari

Research: Supported research projects and workshops initiated by EE faculty
Visitor Program & Seminars: Encouraged leading researchers around the world to visit USC, give talks, and work with EE faculty and students
Annual Department Events: Developed, organized and hosted by MHI to encourage collaboration of faculty, students, and alumni
Scholar Program: Award, travel funding, workshop and event support

67%
14%
10%
9%

67%
9%
14%
Ming Hsieh Institute

Ming Hsieh Institute, Department of Electrical Engineering
USC Viterbi School of Engineering
3450 McClintock Ave., EEB 131, Los Angeles, CA 90089 | p: 213-740-2154 | e: info-mhi@ee.usc.edu
mhi.usc.edu

Ming Hsieh Institute Suite, from top left: MHI Lounge, MHI Kitchen, Ming Hsieh Department Seminar Room, and MHI Conference Room

Ming Hsieh Institute
intelligent technologies to empower mankind

Annual Report
2013/2014

Established in 2010, The Ming Hsieh Institute (MHI) is a research institute focused on enhancing academic and research programs within the Ming Hsieh Department of Electrical Engineering. By 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.
Seminars & Research

**Electrical Engineering Pioneer Series Spring 2014-Present** - Developed in the Spring of 2014, by the Ming Hsieh Institute, the EE Pioneer Series focuses its attention on the stories and journeys of the many faculty who have been a crucial part of the growth and evolution of the EE Department over the last several decades. This new series includes a technical presentation from the honored faculty member as well as an oral history interview. This year’s honoree included Professor William Steier (4/18/14) and Professor Robert (Bob) A. Schultz (5/2/2014).

**CommNets Seminar Series** - (Principal Investigator: 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 primary goals of the series is to expose students in various areas to the work taking place in other areas of engineering. The seminars, open to all, have been very well-attended over the course of the last year, and have featured speakers from USC, UCLA, Stanford, and Berkeley.

**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 integrated Systems Seminar Series hosted a total of 21 invited speakers during the 2013-14 academic year. These prominent speakers spanned various research disciplines including integrated circuits, devices, and technology. Notable speakers included Dr. Ghavam Shahidi, Director of Silicon Technology at IBM and an IBM Fellow, Dr. Babak Parviz, Creator of Glass and a Director at Google X, and Dr. Alexander Ryltakov from IBM T.J. Watson Research Center.

**Medical Imaging Seminar Series** - (Principal Investigator: Krishna Nayak) Spring 2012 - Present. The 2013-2014 MHI Sponsored Medical Imaging Seminar Series had a successful second year with a total of 20 seminars. Attendance ranged from 20 to 40 at each seminar. In Fall 2013, sixteen graduate students registered for a 1-unit EE 598 seminar course and were required to attend 80% of the talks and write reports on two of them.

**Ph.D. Student Seminar Series** - The Ph.D. Student Seminar Series is aimed at improving interaction and fostering a tight-knit community among EE Ph.D. Students. Created by the 2012-13 Ming Hsieh Institute Scholars, this seminar provides an informal environment where current Ph.D. students give a 20 minute talk about their research topic and gain feedback from their fellow students. The 2013-2014 Ph.D. Seminar series took place in Spring 2014 and featured 5 USC EE Ph.D. student speakers.

**Single Photon Source Testbed for Quantum Computing and Quantum Information Processing**

**Principal Investigator:** Stephen Chinn

**Co-PIs:** T. Levi, D. Li, D. M. Povnelli, A. Willner, J. O’Brien, W. Wu

**Duration:** 11/2013-10/2015

The single photon source testbed for quantum computing and quantum information processing aims to build an electrically-driven single photon source testbed at USC. Single photon sources are an essential building block for quantum information processing. Currently, there are no off-the-shelf components capable of producing single photons in a controllable way. As a result, the vast majority of the existing work in the field has been theoretical rather than experimental. Dr. Ioannis Chatzakis was hired on Nov 1, 2013 to help carry out the proposed effort. Since funding began, a new optical setup for measuring photon emission from individual carbon nanotubes has been built. Researchers are preparing two papers on the exciton dynamics in carbon nanotube pin-junctions, and the papers will contain new validation techniques for identifying strongly luminescent nanotubes. Results from the research were presented at both Texas A&M University and at the 22nd Electrochemical Society Meeting.

**Creating the USC Technology Enabled Aging Mind Center (TEAMc)**

**Principal Investigator:** Shri Narayanan

**Co-PIs:** U. Mitra, M. Annawaram, P. Georgiou, S. Gupta, G. Su, Krishna Nayak

**Duration:** 08/2013-08/2014

**Project Description:** The overarching goal of the TEAMc project is to determine the correlation between cognitive and physical impairment as we age, and quantify the variability across people, through direct measurements of behavior in real living conditions. There is considerable heterogeneity in the aging trajectories posing diverse requirements for technology design and modeling. TEAMc takes a unique integrative consideration of physiological, physical, cognitive and emotional aspects. The specific aim of the Ming Hsieh Institute supported effort is to build and test a wireless health and wellness monitoring system. This includes building the system components for test deployment, deploying the system on a select few participants, and to do preliminary analysis on generated data.

**PhD Students Research Festival October 11, 2013**

The Ming Hsieh Institute annually hosts the Ming Hsieh Department of Electrical Engineering Research Festival. The Research Festival is a day-long event that welcomes the entire USC Viterbi community, alumni and engineering industry representatives. Over 100 undergraduate and graduate students present their research through poster sessions, demonstrations and oral presentations at the event. Save the Date for the 5th Annual Research Festival November 7, 2014!

**USC MRI Speech Summit February 18-19, 2014**

The USC Speech MRI Summit was held at Camillieri Hall at the Brain and Creativity Institute at USC. The Summit spanned the course of two days, and brought together researchers in the field of real-time MRI. The program included sessions on Scientific and Clinical Applications, Current and Emerging Technology as well as Professed Abstracts. Guest speakers at the Summit hailed from all across the United States and even Australia.

**EE Commencement Luncheon May 15, 2014**

Graduates from the class of 2014, their families, and advisors gathered for the first ever, Electrical Engineering PhD Commencement Luncheon hosted by the Ming Hsieh Institute, and immediately following the PhD Hooding Ceremony, the luncheon offered the opportunity for those in attendance to hear stories from advisors about the recently graduated students. Advisors recounted tales of their student’s research, and what successes lie ahead for the new graduates. Thank you to those who attended, and the Ming Hsieh Institute looks forward to doing it again next year!

**Visitors Program**

**Dr. Zhores Alferov**

St. Petersburg University (Principal Investigator: P. Daniel Dapkus) Fall 2013. Dr. Alferov was invited to present this year’s Munushian Keynote lecture at USC on October 29, 2013. Alferov is the 2000 Nobel Prize winner in physics for the invention of the heterojunction bipolar transistor. The heterojunction bipolar transistor forms the basis for the worldwide communications network and many other important applications. He is the president of St. Petersburg University and provided a unique prospective on technology in this century.

**Dr. Frank Kober**

Aix-Marseille University (Principal Investigator: Krishna Nayak) Spring 2014. Dr. Kober heads an MR methods team and specializes in MRI sequence development. He focuses on Arterial Spin Labeling Magnetic Resonance Imaging, Magnetic Resonance Spectroscopy, and cardiac applications in both rodents and humans. The major outcomes of his visit were (1) research collaboration with two PhD students Ahsan Javed and Hung Do, (2) development of a review-paper on cardiac ASL-MRI (co-authored with Professor Nayak).