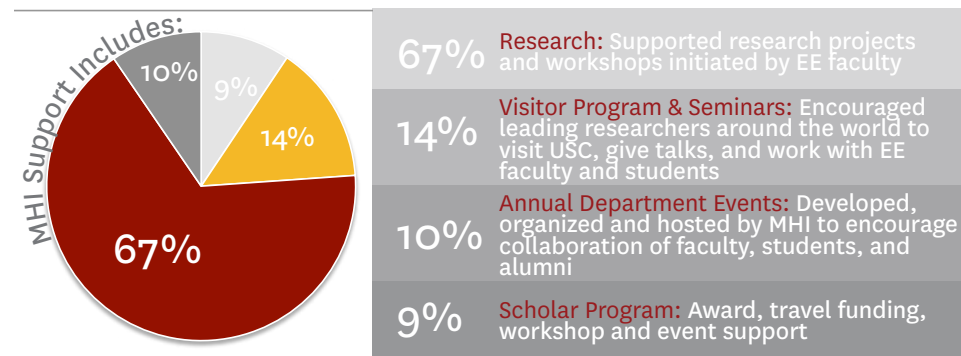


Established in 2010, The Ming Hsieh Institute (MHI) is a research institute focused on enhancing academic and research programs within the Ming Hsieh Department of Electrical Engineering. By supporting innovative activities and hosting top research visitors, MHI positions the department at the forefront 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.



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.



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

MHI Leadership

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

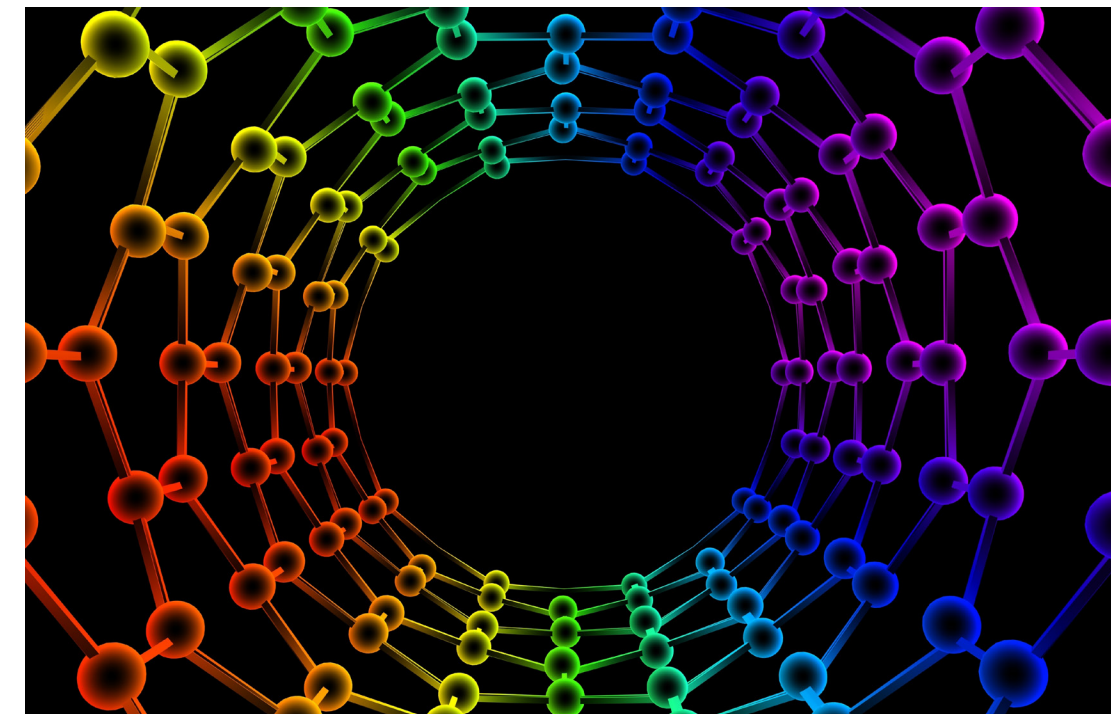
2013-2014 Faculty Advisory Council

Murali Annavaram
 Giuseppe Caire
 Stephen Cronin
 Mahta Moghaddam
 Krishna Nayak
 Antonio Ortega
 Massoud Pedram

Ming Hsieh Institute, Department of Electrical Engineering
 USC Viterbi School of Engineering
 3740 McClintock Ave., EEB 131, Los Angeles, CA 90089 | p: 213-740-2694 | e: info-mhi@ee.usc.edu
 mhi.usc.edu

Ming Hsieh Institute

intelligent technologies to empower mankind



Annual Report
 2013/2014



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

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

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 honorees included Professor William Steier (4/18/14) and Professor Robert (Bob) A. Scholtz (5/2/2014).



Pictured above: Professor Urbashi Mitra and Professor Robert (Bob) A. Scholtz at the Electrical Engineering Pioneer Series held on 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.

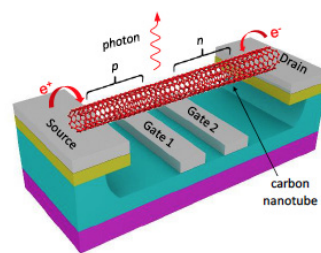
This series targets academia and industry speakers in integrated systems, circuits, and devices, with a wide range of applications including communication, computation, networking, sensing and imaging. The Integrated Systems Seminar Series hosted a total of 22 invited speakers during the 2013-14 academic 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 Google Glass and a Director at Google X, and Dr. Alexander Rylakov 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 Cronin
Co-PIs: T. Levi, D. Lidar, M. Povinelli, 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 pn-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 225th Electrochemical Society Meeting.

Creating the USC Technology Enabled Aging Mind Center (TEAMc)

Principal Investigator: Shri Narayanan
Co-PIs: U. Mitra, M. Annavaram, P. Georgiou, S. Gupta, G. Sukhatme

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 quantifying 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.



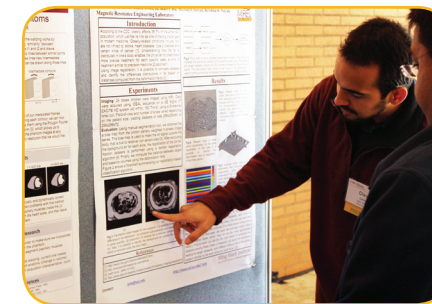
VISITORS PROGRAM



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 demonstration of the first CW semiconductor laser that forms the basis for the worldwide communications network and other important applications. He is the president of St. Petersburg

University and provided a unique prospective on technology in this century.

EVENTS



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 Proffered 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!



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, mainly for 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).