

The SPIE UCONN Student Chapter Officers:

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Members of the Chapter (19):

1) Hassan S. Salehi, 2) Fahad Althowibi, 3) Michael Ambroselli, 4) Wenbo Dou, 5) Mohsen Erfanzadeh, 6) Edward Eskew, 7) Yanping Gong, 8) Hai Li, 9) Rosana Martínez-Castro, 10) Donald McMenemy, 11) Sreyankar Nandy, 12) Yevhen Rutovytskyy, 13) Mohammed Abbas Zakaria,, 14) Hamed Vavadi, 15) Tianheng Wang, 16) Michael Williams, 17) Chen Yang, 18) Guangqian Yuan, 19) Feifei Zhou.



2013-2014 Past Activities:

May 14, 2013: *Second Biennial SPIE/OSA Student Conference on Optics and Light*

Jointly hosted by UConn's SPIE and OSA student chapters, with two invited speakers (one sponsored by SPIE's visiting lecturer program, and another one by OSA). Students also presented their research in this conference.

SPIE Speaker: Michael Larson, Ph.D. (University of Colorado at ColoradoSprings)

(See appendix for pictures)

November 11, 2013: *The SPIE and OSA Technical Meeting at UCONN*

The SPIE UCONN Student Chapter and the OSA UCONN Student Chapter were proud to host two distinguished speakers from Menlo Systems. The meeting was held on Monday November 11, 2013 from 11 am to 1 pm in 336 ITE conference room at the University of Connecticut.

First speaker was *Dr. Jason Reeves*. He received his Ph.D in physics from *Stony Brook University* and he is a sales and service engineer at Menlo Systems.

Abstract: Menlo Systems is a company that offers some very exciting ultrafast technology. The company was formed as a spin-off of Theodor Hansch's group at the Max-Planck Quantum Institute and is well known for the commercialization of the 2005 Nobel Prize optical frequency comb technology. This talk provides a brief history of the company product development and specifically focuses on applications of optical frequency combs. Examples of research by our team and our customers will be shown to explain why we think this technology is so powerful.

Second speaker was *Dr. Rafal Wilk*. He received his Ph.D in terahertz technology from Institute for High-Frequency Technology, *Technical University Braunschweig*, Germany, in 2007. He is currently employed as a member of the Research and Development Department at Menlo Systems GmbH, Martinsried, Germany.

Abstract: Research in the THz frequency range is a growing field that has many research and commercial applications. The goal of this talk is to provide background information on the



production, detection, and uses for THz radiation. THz time-domain spectroscopy and imaging techniques will be discussed along with a short introduction to a novel technique called Optical Scanning by Cavity Tuning (OSCAT) for faster imaging. Practical examples of spectroscopy, non-destructive testing of polymers, and applications to homeland security will be presented to show the practicality of the Menlo Systems' spectrometers.

(See appendix for pictures)



2014 Planned Activities:

June 4th 2014: ECE department seminar

Jointly hosted by UCONN SPIE and UCONN OSA chapters, a technical meeting and conference is being held. Details are as followed.

Wed June 4 at 1:45 pm

LOCATION: ITEB 336 Conference Room

Title: Efficient Target Detection using an adaptive compressive imager

Speaker: Dr. Abhijit Mahalanobis

Corporate Fellow, Lockheed Martin Company

Abstract: The goal of a target detection system is to determine the location of potential targets in the field of view of the sensor. Traditionally, this is done using high quality images from a conventional imager. For wide field of view scenarios, this can pose a challenge for both data acquisition and system bandwidth. A compressive sensing technique for target detection that dramatically reduce the number of measurements that are required to perform the task, as compared to the number of pixels in the conventional images is presented. This in turn can reduce the data rate from the sensor electronics, and along with it the cost, complexity and the bandwidth requirements of the system. Specifically, we discuss a two-stage approach that first adaptively searches a large area using shift-invariant masks to determine the locations of potential targets (i.e. the regions of interest), and then re-visits each location to discriminate between target and clutter using a different set of specialized masks. We show that the overall process is not only highly efficient (i.e. dramatically reduces the number of measurements as compared to the number of pixels), but does so without appreciable loss in target detection performance.

(See appendix for biographical information about the speaker.)



June 9, 2014: ECE department seminar

Jointly hosted by UCONN SPIE and UCONN OSA chapters, a technical meeting and conference is being held. Details are as followed.

Mon June 9 at 3:15 pm-4:15 pm

LOCATION: ITEB 336 Conference Room

Title: Novel Optical Metrology Projects at GE Global Research

Speaker: Kevin Harding, Principal Engineer, GE Global Research

Abstract:

Optical metrology offers a wide range of tools for modern manufacturing environments. There are many commercial tools on the market today ranging from laser probes and machine vision sensors to full 3D mapping systems. However, sometimes what is available just is not sufficient for the needs in precision manufacturing environments. GE manufactures aircraft engines used by airlines around the world, power turbines that produce terrawatts of power, wind power generators that dot the American southwest, locomotives that pull many of the trains around the world, and medical equipment from microscopes to CT scanners. All of these products require manufacturing tolerances that push the boundaries of available measurement systems. This presentation will discuss some of the recent work at GE Global Research to address some of this measurement challenges and the novel methods developed by the GE research teams.

(See appendix for biographical information about the speaker.)

Financial Statement for Fiscal Year 2013-2014

Income: \$900.00

Expenses:

608 - Refreshments -- Organization 80.41

620 - Refreshments -- Events/Programs 43.96

632 - Prior Year Expenses 0

Total Expenses: \$124.37

Net Profit (Loss): (\$124.37)

Beginning Balance as of 09/01/2013: \$ 1,977.51

Received Grant by SPIE on 12/23/2013: \$900

Current Balance: \$2,753.14

Appendix:

May 14, 2013: Second Biennial SPIE/OSA Student Conference on Optics/Light



November 11, 2013: *The SPIE and OSA Technical Meeting at UCONN*



June 4th 2014, ECE department seminar:

Biographical information about the speaker:

Dr. Abhijit Mahalanobis is a Lockheed Martin Corporate Fellow, and currently serves as the Manager and Technical Lead for ATR programs at Lockheed Martin Missiles and Fire Control, Orlando. In this capacity, his key thrusts have been in developing new business, building customer relations, and transitioning advanced technologies to industry products. His main interests are in multi-sensor automatic target recognition, pattern recognition, and image processing. He has made significant contributions to the field of Correlation Pattern Recognition, and has over 100 journal and conference publications in this area. He has organized and lead large teams that include academia and industry on several projects with various DoD organizations, including several with DARPA such as Multi-Scale ATR (DSO), Integrated Sensing and Processing (DSO), and LACOSTE (SPO).

Abhijit completed his B.S. degree with Honors at the University of California, Santa Barbara in 1984. He then joined the Carnegie Mellon University and received the MS. and Ph.D. degrees in 1985 and 1987, respectively. He was awarded the Lockheed Martin Corporation's highest honor in 2005, the NOVA award, for his efforts to promote the company in the field of Automatic Target Recognition. He is a fellow of OSA and SPIE.

June 9th 2014, ECE department seminar:

Biographical information about the speaker:

Kevin Harding is a Principal Engineer in GE Global Research. Kevin has over 35 years in the field of optical technology and metrology, with over 65 patents, 150 papers, several book chapters and a book, the CRC Handbook of Optical Dimensional Metrology for which he is the editor and primary author. Kevin has been recognized for his work by the Society of Manufacturing Engineers (Eli Whitney Award), the Engineering Society of Detroit, and the Automated Imaging Association (leadership awards). He is a fellow and past president of SPIE – the International Society for Optics and Photonics, through which he has also presented many years of tutorials on optics and optical metrology, as well as chaired numerous conferences for close to 30 years.