



## A Message from the Chair

To those of our members who follow the academic calendar, welcome back to the Fall Semester! To you and all of our other members, I hope you have had an enjoyable and productive summer.

I and the other members of our IEEE Central Illinois Section (CILS) Executive Committee (ExComm) are busy putting together our fall schedule, working hard to make IEEE CILS a local organization that we can all be proud of. We have some exciting talks and events planned, the first of which is announced below in this newsletter. Stay tuned and check your email for more details on additional meetings as we iron them out.

In addition to event planning, CILS is currently accepting nominations for its Executive Committee for the 2016 calendar year. The positions available (with current and nominated officers indicated) are listed below. Depending on the number of nominees, we will determine whether a section-level vote is necessary. Please contact me for more details on the responsibilities of any of these positions and/or to nominate yourself or another good candidate.

Position	Current	2016 Nominee(s)
Chair	Tim O'Connell	Tim O'Connell
Vice Chair	Nenad Marjanovic	Nenad Marjanovic
Secretary	Anu Gokhale	Anu Gokhale
Treasurer	Byron Truax	Byron Truax
PES Chapter Chair	Josh Williams	
PES Vice Chair	Karl Kohlrus	Karl Kohlrus

In addition to the ExComm positions, CILS is looking to fill the following vacant positions:

**Student Activities Chair:** You will interface with the various student groups in our section (including groups at UIUC, Illinois State, Bradley, UIS and others) and report back to the section. This may include co-organizing events with students, sponsoring student activities, or other interactions with student branches. Our goal is to make sure our valuable student IEEE members transition to professional membership as they graduate and enter the workforce.

**Web/Social Media Chair:** You will manage our section's web site and social media feeds. We would like to encourage more interaction and engagement between our membership and the local section.

**Society Liaison:** You will interface with the societies in our section and keep our section members informed of any activities. Currently, our Executive Committee contains members of the Power Engineering Society. However, we would like to involve more societies in our section activities. We would like to publicize society activities/events and encourage our section membership to become more involved.

**Membership Development Chair:** You will interface with the IEEE (usually via monthly teleconferences) and implement member recruitment and retention initiatives. This role is very important for maintaining a healthy number of members in our local section.

**Young Professionals Chair:** You will interface with the IEEE Young Professionals group (formerly GOLD), which is specifically geared toward the younger professional members of our section. Organizing social events, seminars/webinars, or networking events is also encouraged.

**Women in Engineering (WIE) Chair:** You will interface with the IEEE WIE to facilitate the recruitment and retention of women engineers in our local section. This position is similar to the Young Professionals Chair, but is specifically geared toward women.

Please contact me, Tim O'Connell, directly at [tim.oconnell@ieee.org](mailto:tim.oconnell@ieee.org) if you are interested, or if you know someone who might be.

Also, don't forget that you can now follow the IEEE Central Illinois Section on Twitter at @IEEECILS and check out our updated website at <http://sites.ieee.org/central-illinois/>.

Our first event of the fall will be an exciting talk about the current progress in smartphone biosensors by University of Illinois Professor Brian Cunningham. I am looking forward to seeing you at this and our other upcoming section events!

Sincerely,



Tim O'Connell, Chair

Visit: [Central Illinois Section Web-site](#)

**September Meeting: Wednesday, September 23<sup>rd</sup> @ 6:00 PM**

## **Smartphone Biosensors: Lab-in-a-Pocket Diagnostics**

**Brian Cunningham**

**Professor in ECE & Bioengineering Departments  
University of Illinois, Urbana-Champaign**

**Date: Wednesday, September 23<sup>rd</sup>, 2015**

**Time: 6:00 PM - 7:30 PM**

**Location: 1000 MNTL (Micro and Nano Technology Lab)  
208 N. Wright St.  
Urbana, IL 61801**

**Organizer: Nenad Marjanovic, CILS Vice chair**

**For questions, contact Nenad Marjanovic <[nenad.marjanovic@ieee.org](mailto:nenad.marjanovic@ieee.org)>**

## **Abstract:**

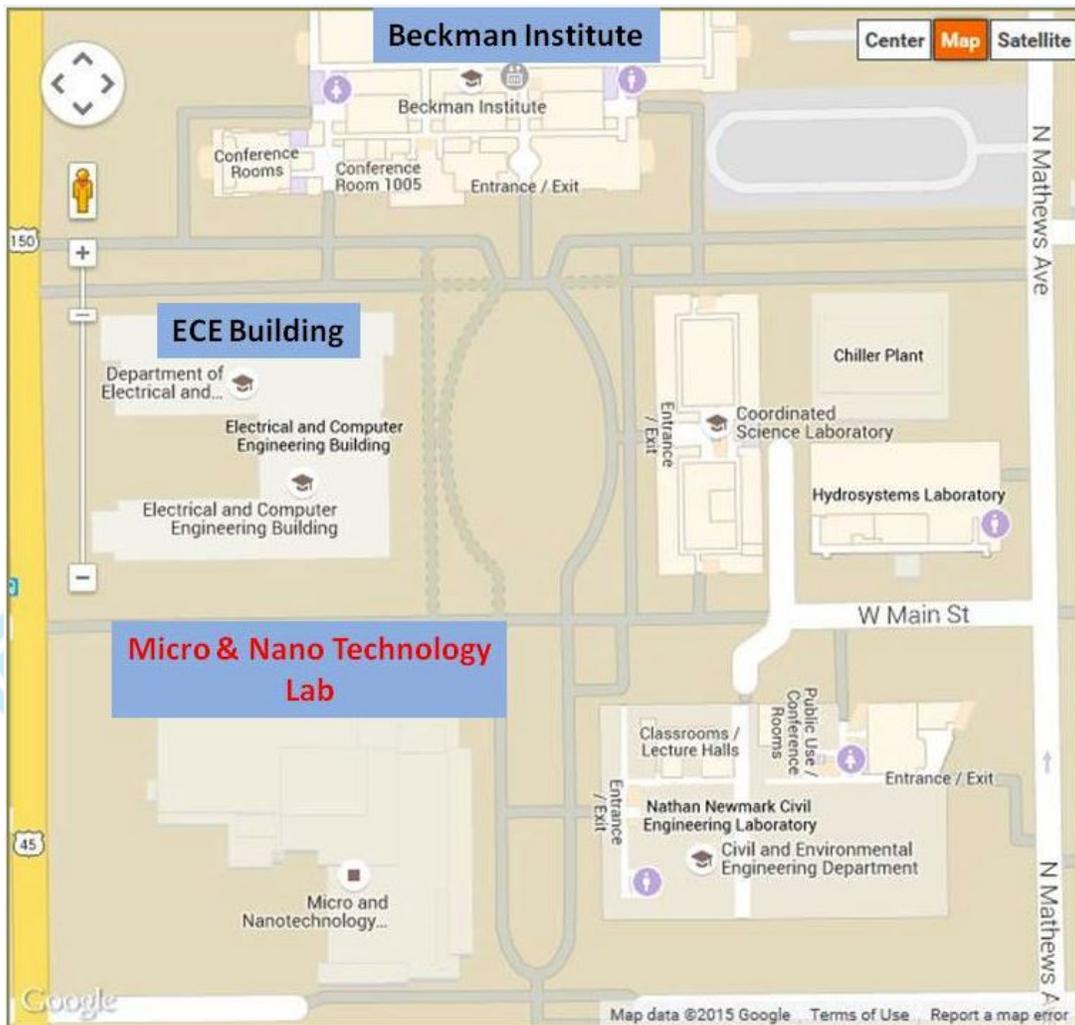
Since their introduction in 1997, “smart” mobile phones with internet connectivity, high resolution cameras, touch-screen displays, and powerful CPUs have gained rapid market acceptance driven by a combination of falling prices and increasingly sophisticated features. In addition, there is a growing ecosystem of applications that take advantage of the phone’s sensors, display, and connection to powerful computing and data storage capabilities that are available in the “cloud.” The built-in capabilities of smartphones can be further extended through the addition of accessories that enable the phone to sense different types of information. Incorporation of biosensing into mobile platforms is a potentially powerful development, as biological assay capabilities that have previously only been available through expensive laboratory-based instruments may be utilized by anyone. Such developments may help to facilitate the goal of “personalized medicine” in which home-based tests may be used to diagnose a medical condition, but with a system that automatically communicates results to a cloud-based monitoring system that alerts the physician when warranted. Low-cost portable biosensor systems integrated with mobile devices may also enable diagnostic technology that can be translated to resource-poor regions of the world for pathogen detection, disease diagnosis, and monitoring of nutritional status. Such systems, deployed widely, would be capable of rapidly monitoring for the presence of environmental contaminants over large areas, or tracking the development of a medical condition throughout a large population. This talk will summarize recent developments in the Cunningham Group at Illinois in the utilization of integrated smartphone cameras as a high resolution spectrophotometer that is capable of measuring ELISA assays, label-free photonic crystal biosensor assays, thin film chromatography, and fluorescence spectroscopy. Utilizing special purpose, low-cost cradles for common smartphones and plastic microfluidic devices for facilitating liquid-handling tasks, we have demonstrated detection of cancer biomarkers, food allergens, pathogen DNA, organic contamination of beverage dispensing lines, and fraudulent drugs – with performance that rivals results obtained with conventional laboratory instruments. Current efforts are aimed at developing a smartphone-based multimode (ELISA, FRET, FP, and Photonic Crystal) detection instrument that can perform the functions of several laboratory-based tools.

## **About the speaker:**

Brian T. Cunningham is a Professor in the Department of Electrical and Computer Engineering and the Department of Bioengineering at the University of Illinois at Urbana-Champaign, where he also serves as the Director of the Micro and Nanotechnology Laboratory, and as Director of the NSF Center Innovative Instrumentation Technology (CIIT). He holds the Donald Biggar Willett Professorship of Engineering. His research is in the development of biosensors and detection instruments for pharmaceutical high throughput screening, disease diagnostics, point-of-care testing, life science research, and environmental monitoring. He has published 125 peer-reviewed journal articles, and is an inventor on 75 issued US patents. Prior to joining the faculty of Illinois in 2004, Prof. Cunningham was a co-founder of SRU Biosystems in 2000. He founded Exalt Diagnostics in 2012 to commercialize photonic crystal enhanced fluorescence technology for disease biomarker detection. Acoustic MEMS biosensor technology that he developed in his early career at Draper Laboratory has been licensed and commercialized by Bioscale, Inc. for applications in pathogen detection and diagnostics. Prof Cunningham's work has recently been recognized with the IEEE Sensors Council Technical Achievement Award for the invention, development, and commercialization of sensors based upon photonic crystals. He is a Fellow of IEEE, OSA, AIMBE, and is a member of the National Academy of Inventors. Additional information on his research can be found on his web site: <http://nano.ece.illinois.edu>.



## Directions:



Please click on the following links to get the site, map and directions:

[MNTL - Google Maps](#)

For the full agenda, registration and information, please click on the link below:

**[September 23rd Meeting Registration](#)**

**\*\* Food and drinks will be provided \*\***



**IEEE**



IEEE Central Illinois Section (CILS)  
c/o Tim O'Connell  
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Savoy, Illinois 61874



IEEE

**Central Illinois Section Officers**

**Chair**

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**Secretary**

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**Vice Chair**

Nenad Marjanovic  
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**Power Engineering Society – Officers**

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**Chapter Vice Chairperson**

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