

## 2016 Call for Proposals

The Foundation invites proposals for one-year supplementary funding (\$20,000). The project must focus on cross-disciplinary research involving analog or mixed analog-digital integrated circuits. This year's theme is "Interface to physical world; sensor or MEMS".

Deadline: December 1, 2015

For more information, please visit  
<http://www.catalyst-foundation.org>

## Student Support Funding to IEEE CICC

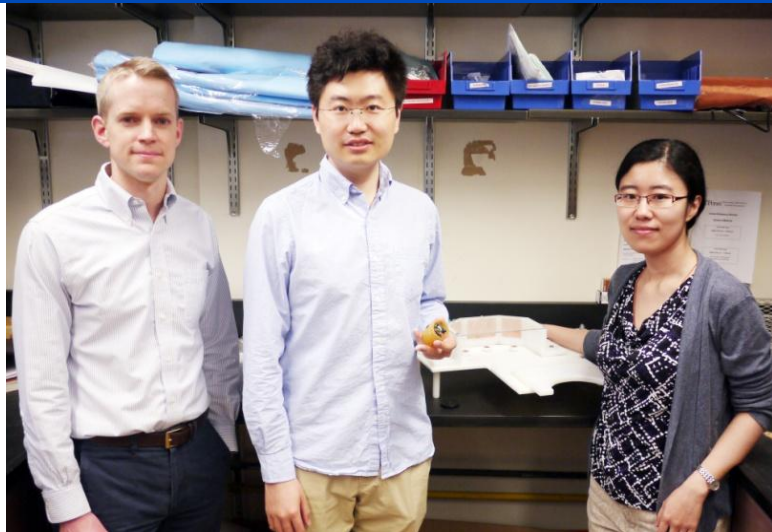
The Foundation is contributing \$3,000 to the 2015 IEEE Custom Integrated Circuits Conference (CICC) for supporting student participation in this premier professional conference. It will be held in San Jose, CA on September 28-30, 2015.



## ***Congratulations, University of Pennsylvania for getting a supplementary funding!***

The new supplementary funding project is an exciting cross-disciplinary one on the sensor-brain-interface, led by Professors Jan Van der Spiegel and Timothy H. Lucas. The brief description of this project is in this newsletter. Currently, we are also funding four full-funding projects. The funded universities include Columbia University, Harvard University, Purdue University, and Oregon State University. All of these research projects are making good progress and you can find the current status through the annual report in our homepage. This year, we are planning to solicit another supplementary funding project as described later in this newsletter.

## 2015 Supplementary Funding Project



Researchers involved in the project.  
Dr. Andrew Richardson (left),  
Mr. Xilin Liu, and  
Dr. Milin Zhang

### ***Design of a Low Power Smart Glove for Sensor-Brain-Interface to Reconstruct Somatosensory Feedback and Gestures***

University of Pennsylvania

Principal Investigators:

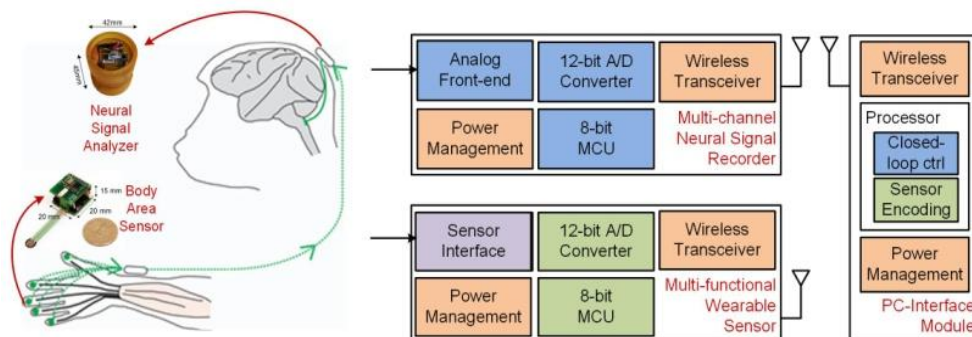
Prof. Jan Van der Spiegel (Department of Electrical Engineering)

Prof. Timothy H. Lucas (Department of Neurosurgery)

The objective of this project is to develop a sensor-brain interface (SBI), which can restore the sense of touch and the sense of movement in a paralyzed hand. This proposal focuses on an ergonomic system for detecting force and vibration at the fingertips and movement at the finger joints. An ultra-low power, wireless, wearable sensor network solution is being developed. To improve functionality and circumvent the limitations of a discrete-component sensor node, an active sensor node will be powered by harvesting energy from the environment.

Low-power sensors, including, but is not limited to, accelerometer, stretch sensor, and force sensor, will be used to develop a sensor network. A custom fully integrated detection circuit, consisting of 1) wireless power transmission, 2) multi-channel, low power analog front

end, 3) wireless data transmission, and 4) an optional sensory encoder will be developed. The final outcome is a wireless, battery-free, wearable smart glove that can be utilized in the testing of in-vivo functionality of the SBI system.



## On-going Full Funding Projects

- ***Urine-Powered Wireless Urinary Tract Infection Monitoring Sensor for Smart Diaper Platform***  
Purdue University: 2014-2018  
Prof. Byunghoo Jung and Prof. Babak Ziaie  
Student: Mr. Weeseong Seo
- ***CMOS-Assisted Nano-Bio Array for Neurotechnology***  
Harvard University: 2014-2018  
Prof. Donhee Ham and Prof. Hongkun Park  
Student: Mr. Jeffrey T. Abbott
- ***Self-Aware Computing for Cyber Physical Systems***  
Columbia University: 2013-2016  
Prof. Mingoo Seok and Prof. Peter Kinget  
Students: Mr. SeongJong Kim and Mr. Teng Yang
- ***Wireless Sensor Microsystem for Measuring the Effects of Vitamins on the Aging***  
Oregon State University: 2011-2015  
Prof. Gabor C. Temes, Prof. Patrick Y. Chiang and Prof. Tory M. Hagon  
Students: Mr. Xing Meng and Mr. Eric Smith