Sustainable Silicon: Energy-Efficient, Self-Aware Microsystems

講員： **Dr. Patrick Chiang**

時間： 102年11月18日(一) 上午 10:30-12:00

地點： 國立台灣大學電機二館124室

大綱： **Energy-efficiency** and **robustness** are essential requirements for next-generation electronic systems, from exascale supercomputers to wearable vital-sign sensor bandages. In a conventional design, extraneous power is consumed in order to satisfy worst-case guard bands. In this talk, I will describe recent work at Oregon State/Fudan, where on-chip adaptation and closed-loop feedback enables a self-adaptive system that can autonomously adapt its power/reliability, based on its operating environment.
Two major research thrusts are presented that illustrate this in situ self-adaptation:

1) Wireline Interconnects: Future many-core systems are limited not by the energy consumed to compute, but by the energy dissipated to communicate.
2) Disposable Sensor Bandage: A sensor-on-a-chip is designed for a disposable battery-less vital-sign patch. Energy-efficiency is paramount in order to eliminate the battery cost/weight.

主講人簡介：

Patrick Chiang received the B.S. degree in electrical engineering and computer sciences from the University of California, Berkeley, in 1998, and the M.S. and Ph.D. degrees in electrical engineering from Stanford University in 2001 and 2007. He is an associate professor (on sabbatical) at Oregon State University. He currently is a 1000-Talents Young Professor at the ASIC & System State Key Laboratory at Fudan University in Shanghai, China.

He is the recipient of a 2010 Department of Energy Early CAREER award and a 2012 NSF-CAREER award, for energy-efficient interconnects and robust near-threshold computing. He is an associate editor of the IEEE Transactions on Biomedical Circuits and Systems, and on the technical program committee for the IEEE Custom Integrated Circuits Conference. He has published over 90 technical conference/journal papers, and has two Best Paper/Faculty awards. He currently leads a group of 20 graduate students/post-docs in energy-efficient circuits and systems, including near-threshold wireline transceivers, reliable silicon photonics, resiliency in near-threshold operation, and energy-constrained medical sensors.

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