MS students present VLSI Design Laboratory Project at International Symposium on Circuits and Systems

A paper written by two MS students, Sanket Gupta and Zhongjie Dai was recently presented in IEEE International Symposium on Circuits and Systems 2016 (ISCAS 2016). The conference was held in Montreal, Canada from May 22nd to May 25th, 2016. The paper is entitled "3.7μW 0.8V VCO-Integrator-Based High-Efficiency Capacitor-Free Low-Dropout Voltage Regulator." Voltage regulators are ubiquitous in electronic systems to create a stable supply voltage for high performance electronics. The proposed regulator uses a novel amplifier based on phase-domain signal processing with voltage-controlled oscillators which leads to improvements in efficiency and a reduction of the quiescent current.

The custom integrated circuit design was done under the supervision of Sarthak Kalani, a Ph.D. student advised by Professor Peter Kinget of the Electrical Engineering Department at Columbia University. Sanket and Zhongjie completed their Master's degree in Electrical Engineering in December 2015 and are currently working at Octopart and Marvell Semiconductor respectively. This project was part of the VLSI Design Lab (http://www.ee.columbia.edu/~kinget/EE6350_S15.html), a course offered by Professor Peter Kinget (http://www.ee.columbia.edu/~kinget) in the Spring semesters. The design lab is a unique course in the integrated circuits (IC) and systems track designed to provide students the experience of learning the complete IC design process. Students go from the specification, to the design, simulation, layout and tape-out of their own IC. The prototype ICs are fabricated at a commercial semiconductor foundry with the financial support of the MOSIS educational program (https://www.mosis.com/pages/products/mep/mep-about). In the Fall semester the students test the ICs and demonstrate them in an application setting. Video demonstrations of the projects are available on the course website (http://www.ee.columbia.edu/~kinget/EE6350_S15/index.html).

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