

Scaling Analog and RF Circuits: Why and How

Wednesday March 19 2014, EWI building Mekelweg 4
DIMES colloquiumzaal, 10.30 – 11.30 room DI. 01.180

Abstract

CMOS technology scaling has fueled tremendous progress in electronics and has brought about system-on-chip (SoC) products with a broad impact on our society and economy. Technology scaling is very beneficial to increase the performance and density for digital signal processing, computation and memory. Analog and radio-frequency (RF) circuits remain the critical interfaces to connect the digital cores of SoCs to the physical world and need to satisfy increasing performance demands. At the same time, designing analog and RF functions with scaled devices and reducing supply voltages is getting progressively harder. Meeting more stringent performance requirements with poorer analog devices makes the task of the analog designer very challenging and interesting. We will review scaling challenges for analog circuit performance and contrast them to digital circuit scaling. We will further discuss design paradigms that address analog and RF circuit scaling, including mixed-domain analog techniques. The talk will also touch upon the novel application opportunities that scaled CMOS technologies enable. We will illustrate how exploiting high speed transistors can enable ultra-low power wireless communications for applications such as building an Internet of Things with energy harvesting active networked tags.



Biography

Peter R. Kinget received an engineering degree in electrical and Mechanical engineering and the Ph.D. in electrical engineering from the Katholieke Universiteit Leuven, Belgium.

He has worked in industrial research and development at Bell Laboratories, Broadcom, Celight and Multilink before joining the faculty of the Department of Electrical Engineering, Columbia University, NY in 2002. He is also a consulting expert on patent litigation and a technical consultant to industry. His research interests are in analog, RF and power integrated circuits and the applications they enable in communications, sensing, and power management.

Peter is widely published and received several awards. He is a Fellow of the IEEE. He has been a "Distinguished Lecturer" for the IEEE Solid-State Circuits Society (SSCS), and an Associate Editor of the IEEE Journal of Solid State Circuits (2003-2007) and the IEEE Transactions on Circuits and Systems II (2008-2009). He has served on the program committees of many of the major solid-state circuits conferences and currently is currently an elected member of the IEEE SSCS Adcom (2011-2013 & 2014-2017).