



**IEEE Solid-State Circuits Society SSCS Distinguished Lecture
IEEE SSCS/CASS Atlanta Joint Chapter Seminar**

**Time-based signal representation and its applications to data conversion,
filtering, and control**

Speaker: Professor Pavan Kumar Hanumolu

Affiliation: University of Illinois, Urbana-Champaign

Abstract: Classical analog and mixed signal processing functions such as filtering and analog to digital conversion are performed in voltage, current, or charge domains. High precision is typically achieved by processing voltage/current/charge domain signals using high gain amplifiers embedded in negative feedback. However, achieving high gain in deeply scaled and beyond CMOS technologies is difficult. In this talk, I will present time-based signal representation as an alternative to classical voltage or charge-based signal representations. I will then show how this representation enables the implementation of fundamental building blocks such as integrators using mostly digital circuits. Finally, I will present case studies of time-based analog filters, analog to digital converters, and DC-DC converters to highlight the advantages, opportunities, and drawbacks of the time-based approach.



Speaker Biography: Pavan Kumar Hanumolu is currently an Associate Professor in the Department of Electrical and Computer Engineering at the University of Illinois, Urbana-Champaign. He received the Ph.D. degree from the School of Electrical Engineering and Computer Science at Oregon State University, in 2006, where he subsequently served as a faculty member till 2013. Dr. Hanumolu's research interests are in energy-efficient integrated circuit implementation of analog and digital signal processing, sensor interfaces, wireline communication systems, and power conversion.

Seminar Time: 1:30PM-2:30PM on September 23rd 2016

Seminar Location: TSRB 509, Georgia Tech.

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