



Nima Maghari

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BIO

Nima Maghari (M'18) received the B.S. degree in electrical engineering from the University of Tehran, Iran, in 2004 and the Ph.D. degree in electrical engineering from Oregon State University in 2010 .

He is currently an associate professor at the department of electrical and computer engineering, University of Florida, Gainesville. From 2004 to 2006, he was with IC-LAB, University of Tehran, where he was involved with audio delta-sigma converters and low-voltage bandgap references. In 2008 he was recipient of CICC-AMD outstanding student paper award. He has served as an Associated Editor of IEEE Transactions on Circuits and Systems-I, IET Electronics Letters and the technical program committee of IEEE CICC as Data Converter Sub-Committee Chair, and the editorial board of Journal of Solid-State Circuit Letters. He is currently serving as Technical Program Committee member of International Solid-State Circuits Conference (ISSCC).

His research interests include high performance analog-to-digital converters, delta-sigma modulators, synthesizable analog circuits, low-power low-voltage regulators, and analog security and counterfeit detection.

VCO Based Chopping for Sensor Interface Application & Multi-Loop Delta-Sigma ADCs

ABSTRACT

Part 1-VCO Based Chopping for Sensor Interface Applications

Abstract- The main challenges in integrated sensor for IoT applications are often the accuracy, silicon area and batter life of the sensor interface circuit. One of the main contributors to these tradeoffs is the flicker noise which heavily impacts lower frequency band. To combat flicker noise, various techniques have been explored in past few decades. The two most commonly used are correlated double sampling (CDS) and chopper modulation. While CDS filters the flicker noise, it will result in noise aliasing which will result in poor overall noise performance. On the other hand, chopping modulates the low-frequency components including flicker noise and offset to higher frequency where it will be filtered by a low-pass filter. However, chopping results in aliased noise floor and out of band modulations. In this work, we present a new nanowatt sensor front-end circuitry using VCO based chopping which not only reduces the out of band modulation tones, but also serves as quantizer.

Part 2- Multi-Loop Delta-Sigma ADCs

Abstract-In this talk, I will present several new approaches to improve the efficiency loop structure of delta-sigma ADCs, by building upon our previous efforts on Sturdy-MASH and Correlated Dual Loop DSMs. All of the proposed structures are verified with silicon measurements to prove their effectiveness and efficiency.

Friday, February 23, 2024 at 1:00 – 2:00 p.m.
Osborne Conference Room (ECSS 3.503)