

# Analog Signal Processing and Application to Embedded Waveform Analysis

Professor Joy Laskar

Georgia Electronic Design Center, School of Electrical and Computer Engineering,  
Georgia Institute of Technology, Atlanta, GA 30332-0269 USA

Email: [joy.laskar@ece.gatech.edu](mailto:joy.laskar@ece.gatech.edu)

*ABSTRACT* — Digital Signal Processing (DSP) based systems suffer from a few disadvantages when expanded into multiple air interface systems. The use of multiple antennas and RF hardware cannot be avoided, but the increase of power consumption from using multiple analog-to-digital converters (ADC) is solvable. Moreover, DSP systems require front end ADCs with high sampling frequencies and high resolution, which leads to high computational burden at the matched filters. We review the development of embedded CMOS analog spectral processors with application to direct waveform generation and detection. These low power circuit implementations form the backbone for future MIMO Radar systems, which will be digital and cognitive.