# Digitally Enhanced Analog Systems

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Dr. Mujica is Director, System Architectures Lab of the Systems and Applications R&D Center at Texas Instruments, Inc. He is responsible for the technical direction of the lab and for maintaining a pipeline of projects in support of businesses across TI. Fernando and the researchers in his organization work on a wide range of technologies including signal processing techniques to enhance analog solutions, signal processing VLSI architectures and massively parallel multi-core programmable co-processors. Fernando's research interests are in the general area of signal processing. He has been granted fifteen US patents and has more in the pipeline. Fernando holds a Ph.D. degree in electrical engineering from the Georgia Institute of Technology, Atlanta, GA, and Electronic Engineering and Magister in Electronic Engineering degrees from Universidad Simón Bolívar, Caracas, Venezuela.

In his spare time Fernando enjoys playing tennis, photography and motor sports. He is a club-racer and high-performance driving instructor for the BMW Car Club of America. He also instructs for Apex Driving Academy and Street Survival, a teenager driving program. He is married to Gayle and they have three children: Elena, Sofia and Andy.

**ABSTRACT**:
Traditional integrated circuit system design methodologies impose boundaries between digital and analog that often result in system inefficiencies in power, performance and/or cost. The problem can be partially mitigated by the co-specification of the digital and analog partitioning. However, significant additional gains can be obtained by using signal processing within the inner workings of analog systems. In this talk, after introducing the rationale behind this type of digitally enhanced analog systems, we will describe some of the applications that we have applied this design methodology to: data converters, digital RF, high-speed serial communications, loudspeaker compensation and adaptive antenna tuning. We conclude the talk with a list of applications that we believe can also benefit from this design methodology.