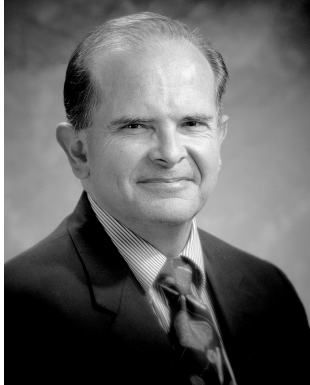


# Challenges in Embedded Computing – Signal and Inference Processing



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## Abstract

This talk addresses the advances in high performance embedded computing. A discussion is presented on the drivers and technology implementation options for the front-end signal and imaging processing. Significant embedded computing is desired on-board the sensor platforms. However, these capabilities demand stringent requirements in low size, weight and power. The talk also addresses the classes of computing needed for back-end processing. Back-end processing is driven by the exploitation of the information. This exploitation processing is very different to front-end processing. The computational capabilities will require new and innovative computing architectures. Some of the topics presented in the talk are addressed in more detail in the recently published book titled: “High Performance Embedded Computing, A Systems Perspective,” by David R. Martinez, Robert A. Bond, and M. Michael Vai, CRC, 2008.

## Biography

Mr. David R. Martinez is Head of the Intelligence, Surveillance, and Reconnaissance (ISR) Systems and Technology Division at MIT Lincoln Laboratory. He oversees more than 300 people and has direct line management responsibility for the division’s programs in the development of advanced techniques and prototypes for surface surveillance, laser systems, active and passive adaptive array processing, integrated sensing and decision support, undersea warfare, and embedded hardware and software computing.

Mr. Martinez joined MIT Lincoln Laboratory in 1988 and was responsible for the development of a large prototype space-time adaptive signal processor. Prior to joining the Laboratory, he was Principal Research Engineer at ARCO Oil and Gas Company, responsible for a multidisciplinary company project to demonstrate the viability of real-time adaptive signal processing techniques. He received the ARCO special achievement award for the planning and execution of the 1986 Cuyama Project, which provided a superior and cost-effective approach to three-dimensional seismic surveys. He holds three U.S. patents.

Mr. Martinez is the founder, and served from 1997 to 1999 as chairman, of a national workshop on high performance embedded computing. He has also served as keynote speaker at multiple national-level workshops and symposia including the Tenth Annual High Performance Embedded Computing Workshop, the Real-Time Systems Symposium, and the Second International Workshop on Compiler and Architecture Support for Embedded Systems. He was appointed to the Army Science Board from 1999 to 2004. From 1994 to 1998, he was Associate Editor to the IEEE Signal Processing magazine. He was elected an IEEE Fellow in 2003, and in 2007 he served on the Defense Science Board ISR Task Force. He is a co-author of a book titled: “High Performance Embedded Computing: A Systems Perspective” to be published in 2008.

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