

**Outline for Advanced Radar DSP 4-hour Tutorial  
to be presented at the IEEE Phased Array 2010 Conference**

**Dr. John E. Ball**

***Tutorial Description***

This 4-hour tutorial course provides an overview of some advanced radar signal processing techniques. The course contains three parts: a short signal processing background review, followed by a discussion on radar signal processing losses and filtering effects, and an advanced section on statistical signal processing, matched filtering, adaptive nulling and sidelobe blanking. The class includes many examples and Matlab® demonstrations. Students are not required to have Matlab.

Part I. Signal Processing Refresher – Sampling, Aliasing, Z-transforms, Convolution, FIR Filtering, Decimation

Part II. Radar Signal Processing – Radar Signal Processing Chain, Radar Signal Processing Losses and Mitigation, Filtering Effects

Part III. Advanced Radar Signal Processing – Statistical Signal Processing and Noise Filtering Basics, Matched Filtering, Adaptive Nulling, Sidelobe Blanking

***Instructor – John Ball***



Dr. Ball received the Ph.D. in Electrical Engineering (EE) in Digital Signal and Image Processing on May 2007 from Mississippi State University, a Masters in EE in digital signal processing from Georgia Tech in 1993, and a BSEE with emphasis on computer architecture from Mississippi State in 1991.

Dr. Ball has sixteen years of industry and government experience as a design engineer, field application engineer, and radar systems engineer. He has worked on a diverse set of signal processing hardware and software systems, including two advanced naval radars, image processing hardware and software, and telephony solutions for plain old telephone systems and voice over IP (VoIP). His areas of expertise include radar signal processing, digital signal processing, digital image processing, computer architecture, and software design and development (C, Matlab).

Dr. Ball has been heavily involved as a core test-team member in the testing and analysis of an advanced naval radar system, and co-lead a team for requirements definition and initial design for another advanced radar system.

Dr. Ball is an IEEE member, and is actively involved in the Geoscience and Remote Sensing, Signal Processing, and Aerospace and Electronic Systems Societies. He currently works as a radar systems engineer for the United States Navy at the Naval Surface Warfare Center Dahlgren Division.