

Education

PhD Candidate in ECE

MS Electrical Engineering with focus on Control Systems, University of New Mexico, August 1998

BS Industrial Engineering, New Mexico State University, May 1983 - Crimson Scholar

Research Interests: Engineering Research Education, Signal Processing, Guidance and Control of Aerial Robots, Speech Processing

He has over 30 years experience with communication and control system evaluation and development. He has worked for Ball Aerospace Engineering, General Motors and Honeywell International.

His research activities include machine learning and its applications to human interfaces such as breathing rate detection and physical stress detection, and the development of robust data communication systems for first responders.

- Communication Engineering - Assisted with characterization of communication systems in U.S. Infantry Divisions to assess impact of introducing the US Army's initial digital communication systems into the communication architecture on the battlefield.

Studied the effects of command and control communications countermeasures on ground-to-air combat and large land combat. The focus being the management of data flows in opposing forces command and communication structures to create exploitable opportunities for friendly force commanders in combat situations.

- Flight Controls Engineer - development of gimbal camera controller system, and a fault tolerant guidance system of the Honeywell T-HAWK™ unmanned aerial reconnaissance vehicle. The gimballed camera system design spanned from the hardware interface to interactions with the flight controls, guidance and vehicle management systems. Flight controls work involved the extension of the T-HAWK™ system onto a family of ducted fan air vehicles. These efforts used both MATLAB and Simulink to develop the final system. This resulted in 2 patents – (8,515,596 - Incremental position-based guidance for a UAV, and 8,219,267 - Wind estimation for an unmanned aerial vehicle)

- System Engineer - supported the Diagnostic and Prognostic Computer Software Configuration Item for the US Army Crusader (Self-propelled Howitzer) through requirements and concept definition. The intent of the system was to anticipate or predict main component failures to support early maintenance of only those systems needing maintenance and providing warnings to the crew of a critical failure far enough in advance to allow for corrective actions.

- Test Engineer - Supported the verification and validation of the Lockheed-Martin Joint Strike Fighter Concept Aircraft's Operating System by adapting existing assembly language based test programs for the Boeing 777 program to support the Joint Strike Fighter effort at Honeywell.

Developed and implemented a test and verification strategy for the C-5 Avionics Modernization Program's operating system.

- Teaching – While at Honeywell, developed training courses for the use of MATLAB, Simulink, and the real time embedded systems coder. He was designated one of the national experts influencing the MATLAB and Simulink packages used in the Honeywell Albuquerque plant. Other teaching experiences include being a TA for the microprocessor class at UNM, basic electronic measurements, digital design with VHDL. Has also coauthored a 300 page lab based course on communication systems (Introduction to Communication Systems Using National Instruments Universal Software Peripheral Radio Lab Manual).

He is actively creating educational content in web-based applications for Cell Phones for the ECE 238 class he teaches. He has been a lecturer in the ECE238, ECE 439, ECE 442 classes and has taught advanced topics classes in Matlab/Simulink Programming. He has acted as a mentor for student exchange programs for students from Mexico and Central and South America.

He is currently engaged with Quanser Inc. in developing an experiential introduction to Electrical Engineering course offering. The class uses robotics and communications to illustrate the different aspects of electrical engineering in a practical approach using a Systems Engineering approach to solving problems. He has also sponsored/mentored several Capstone projects to include developing a Probability Lab Cell phone application, Development of a robust communication network using Software Defined Radios, exploring using Quanser QBot2 and the possibility of swarm behavior and Haptic robot interface between ground robots (Qbit2) and their operators.

His expertise includes the use of MATLAB, Simulink and LABView tools for data collection and analysis.

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