WAYNE T. PADGETT, PH.D.

ROSE-HULMAN INSTITUTE OF TECHNOLOGY
CAMPUS MAIL 117, 5500 WABASH AVENUE
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INDUSTRIAL EXPERIENCE:

ROCKWELL COLLINS – VISITING PROFESSOR — Summer 2010, 2011
(2011) Modified a JPALS simulation for hardware accelerated simulation in Simulink and Xilinx System Generator. Analyzed bandwidth and speed constraints. Debugged tool limitations.
(2010)Redesigned and debugged a modem state machine. Simulated performance of a QAM receiver. Implemented AES using automated design tools.

TEXAS INSTRUMENTS – VISITING PROFESSOR — Fall 2007
Developed new material and worked on a text book on design of signal processing algorithms for fixed-point devices. Worked with DSP Applications group to develop examples for text.

AGERE SYSTEMS – STARCORE DSP APPLICATIONS TEAM (SABBATICAL) — July 2001 – July 2002
Developed and optimized benchmark code for Starcore 4 ALU DSP at assembly level. Concentrated on FIR and adaptive techniques, applied a block exact method to achieve high parallelism for LMS filter.

PROFESSIONAL CONSULTING, PRECISION ACOUSTICS, HOPEDALE, MA — Summer 2000
Wrote a real-time, double-buffered, interrupt driven adaptive filtering system for a noise-canceling stethoscope using a TMS320C54 development system for C and assembly language.

PROFESSIONAL CONSULTING, HUNTSVILLE, AL — Summer 1999
Developed a theoretical framework for evaluation of FIR digital filters with specified properties. Developed a practical filter design method.

ROSE-HULMAN INDUSTRY ASSISTANCE, COLUMBUS, IN — May 1999
Designed voice SSB system for scuba communication. Implemented fixed-point FIR, cascaded biquad IIR, and multirate processing.

PROFESSIONAL CONSULTING, INDIANAPOLIS, IN — Summer 1998
Helped design and analyze a beamforming microphone array.

PROFESSIONAL CONSULTING, TERRE HAUTE, IN — Summer 1995, 1996
Provided a flexible custom mark recognition algorithm.

ATLANTA SIGNAL PROCESSORS, INC., ATLANTA, GA — June 1991 - June 1994
Application Engineer
Provided technical support for TMS320C40, C30, C25, and C10.

TEXAS INSTRUMENTS - MISSILE SYSTEMS, DALLAS, TX — Summer 1989
Graduate Summer Intern - Image Processing Lab
Implemented Hough transformation for line-finding in images.

INTERGRAPH CORPORATION, HUNTSVILLE, AL — Summer/Fall quarters, 1984 - 1989
Engineering Co-op - Terminal Hardware Design Dept.
Designed digital components of a graphics workstation.

RESEARCH EXPERIENCE:

ROSE-HULMAN INSTITUTE OF TECHNOLOGY, TERRE HAUTE, IN — August 1994 - present
Professor of Electrical and Computer Engineering
Continuing research program in real-time DSP, acoustics, and image processing. Graduate student thesis topics in the areas of DSP, microphone arrays, and image enhancement.
MASTER'S THESES ADVISED:
Sucheta Chitale: — January 1999
Blur Identification and Correction for a Given Imaging System
Yu-Kang Ku: — May 1999
Real-Time DSP Implementation of a Delay-Sum Beamformer
Erik Bresch: — May 1999
Application of Digital Signal Processing in Class-D Audio Amplifiers
Masaki Sato: — February 2001
Fixed-point Implementation of Federal Standard 1016 Code Excited Linear Predictive Coder on Texas Instruments TMS320C6701 EVM

GEORGIA TECH RESEARCH INSTITUTE, ATLANTA, GA — September 1992 – August 1994
Research Assistant
Studied optimal detection of nonstationary wideband signals and transient signals. Investigated algorithms for direction of arrival estimation and wavelet transform analysis.

EDUCATION:

DOCTOR OF PHILOSOPHY, ELECTRICAL AND COMPUTER ENGINEERING — June 1994
Detection of Low Order Nonstationary Gaussian Random Processes
Georgia Institute of Technology, Atlanta, GA
Advisor: D. B. Williams
National Science Foundation Graduate Fellow

MASTER OF SCIENCE — December 1990
Concentration in DSP, communications, and controls.
Georgia Institute of Technology, Atlanta, GA

BACHELOR OF ELECTRICAL ENGINEERING — June 1989
Auburn University, Auburn, AL
Cooperative Education, University Scholar, With Highest Honor

TEACHING EXPERIENCE:

ROSE-HULMAN INSTITUTE OF TECHNOLOGY, TERRE HAUTE, IN — August 1994 – present
Professor of Electrical and Computer Engineering — August 2009 – present
Associate Professor of Electrical and Computer Engineering — August 2000 – May 2009
Assistant Professor of Electrical and Computer Engineering — August 1994 – May 2000

Digital Signal Processing (Intro, Graduate and Real-time Project Lab)
Developed New Senior Level Fixed Point DSP course: ECE483
Developed New Junior Level DSP Course: EC380
Supervised DSP Projects for TMS320C3x, C54x, and C6x
Image Processing, Advanced Image Processing
Communication Systems (Intro, I, and II)
Advisor to many independent project courses
Project Catapult (Engineering Camp) Faculty 9 summers

PROFESSIONAL EDUCATION ACTIVITIES:

IEEE SIGNAL PROCESSING SOCIETY – TECHNICAL COMMITTEE ON SIGNAL PROCESSING EDUCATION – CHAIR	2010-2011
CO-PI WITH MARK YODER ON SIGNAL PROCESSING EDUCATION NETWORK NSF GRANT – COLLABORATION WITH RICE UNIV.	2010, 2011, 2012
CONSULTANT TO CONTENT DIRECTED ASSESSMENT GUIDE TEAM (NELSON AND HJALMARSON, NSF GRANT)	January, 2011
CONSULTANT TO SIGNALS AND SYSTEMS CONCEPT INVENTORY DESIGN TEAM (WAGE AND BUCK, NSF GRANT)	January, 2009
PROGRAM CO-CHAIR OF 5TH SIGNAL PROCESSING EDUCATION WORKSHOP, HILTON MARCO ISLAND, FL	January, 2009
WEBSITE DEVELOPMENT FOR OPPENHEIM AND SCHAFER'S DISCRETE TIME SIGNAL PROCESSING, 3RD ED. *With Mark Yoder*	Summer 2008
FIXED-POINT BASICS: IIR FILTERS ON TMS320DM6437 DIGITAL MEDIA PROCESSOR – HANDS-ON WORKSHOP AT TEXAS INSTRUMENTS DEVELOPER CONFERENCE, DALLAS, TX *Co-taught with David V. Anderson of Georgia Tech*	February, 2008
GEORGIA INSTITUTE OF TECHNOLOGY – FIXED POINT SIGNAL PROCESSING SYSTEMS SHORTCOURSE *Co-taught with David V. Anderson of Georgia Tech*	March 24-27, 2008 April 10-13, 2007
ON SITE WORKSHOP WITH INDUSTRY CUSTOMER – FIXED POINT SIGNAL PROCESSING SYSTEMS SHORTCOURSE *Co-taught with David V. Anderson of Georgia Tech*	August 28-30, 2007
MATHWORKS SPONSORED TEXTBOOK DEVELOPMENT ON FIXED POINT *Developed course materials for an undergraduate textbook*	June, 2007
MODERATED SPECIAL SESSION ON FIXED POINT EDUCATION *ASEE Annual Conference 2007, Honolulu, Hawaii*	June, 2007
IEEE SIGNAL PROCESSING SOCIETY – TECHNICAL COMMITTEE ON SIGNAL PROCESSING EDUCATION	2001-present
PROGRAM CO-CHAIR OF 1ST SIGNAL PROCESSING EDUCATION WORKSHOP, HUNT, TX	October, 2000

SELECTED PUBLICATIONS:

Wayne T. Padgett, Mark A. Yoder, and Sarah A. Forbes. Extending the usefulness of the signals and systems concept inventory (SSCI). In *Proceedings of the IEEE Digital Signal Processing Workshop and IEEE Signal Processing Education Workshop (DSP/SPE),* Sedona, AZ, January, 2011.

Wayne T. Padgett and Mark A. Yoder, "Effective Communication: Excellence in a Technical Presentation," *IEEE Signal Processing Magazine,* vol. 25, no. 2, Mar. 2008, pp. 124-127.

Wayne T. Padgett, "Fixed-Point DSP Implementation: Advanced Signal Processing Topics and Conceptual Learning," *Proceedings of the American Society for Engineering Education Annual Conference,* Honolulu, Hawaii, June, 2007.

Wayne T. Padgett, "Teaching Fixed-point Algorithm Development in a Systems Context", *Proceedings of Digital Signal Processing Workshop, 12th - Signal Processing Education Workshop*, 4th, Teton National Park, WY, Sep. 2006, pp. 297-301.

Wayne T. Padgett, Bruce A. Black, and Bruce A. Ferguson, "Low Frequency Wireless Communications System-Infrared Laboratory Experiments," *IEEE Transactions on Education*, vol. 49, no. 1, Feb. 2006, pp. 49-57.

Wayne T. Padgett and Adam J. Thomas, "Development of an iPAQ-based Robotic Vehicle with Wireless Control and Video Feedback," *Computers in Education Journal*, vol. XV, no. 1., Mar. 2005, pp. 23-27.

Wayne T. Padgett, "An Undergraduate Fixed Point Dsp Course," *Proceedings of Signal Processing Education Workshop*, Pine Mountain, GA, October 2002.

Wayne T. Padgett, "Efficient Parallel Implementation of the LMS Algorithm on a Multi-ALU Architecture," *Proceedings of ICASSP-2002*, Orlando, FL, May 2002.

Wayne T. Padgett, Adtran technical memo WTP-99-02, Huntsville, AL, August 12, 1999.

Wayne T. Padgett, Adtran technical memo WTP-99-01, Huntsville, AL, July 22, 1999.

Wayne T. Padgett, "Design Education Using the International Aerial Robotics Competition", *1999 ASEE Annual Conference Proceedings*, July, 1999, Charlotte, NC.

Erik Bresch and Wayne T. Padgett, "TMS320C67-Based Design of a Digital Audio Power Amplifier Introducing Novel Feedback Strategy," Texas Instruments DSPS Fest 99, Houston, TX, August, 1999.

Perry L. Peters and Wayne T. Padgett, "A Scale and Rotation Insensitive Algorithm for Label Location and Identification," *Proceedings of IEEE SoutheastCon*, Lexington, KY, March 1999, pp.264-267.

Sucheta Chitale and Wayne T. Padgett, "Blur Identification and Correction for a Given Imaging System," *Proceedings of IEEE SoutheastCon*, Lexington, KY, March 1999, pp.268-273.

Wayne T. Padgett and Mark A Yoder, "DSP Instead of Circuits? - Transition to Undergraduate DSP Education at Rose-Hulman," *Proceedings of ICASSP-98*, Seattle, WA, May 1998.

Wayne T. Padgett, "Teaching Design Through Design Competition," *Proceedings of Frontiers in Education 1997*, Pittsburgh, PA, November 1997.

Wayne T. Padgett, Columbia House Technical Report, "Final Report on CHC96-010," Terre Haute, IN, August 1996.

Wayne T. Padgett, Columbia House Technical Report, "Final Report on CHC95-013," Terre Haute, IN, August 1995.

Wayne T. Padgett, "Performance Analysis of a Detector for Nonstationary Random Signals," *Proceedings of ICASSP-95*, Detroit, MI, May 1995, vol. 5, pp. 3579-3582.

Wayne T. Padgett and Douglas B. Williams, "Efficient Simulation of Random Signal Detectors", *Seventh SP Workshop on Statistical Signal & Array Processing*, June 1994, Quebec City.

Wayne T. Padgett and Douglas B. Williams, "Detection of Nonstationary Random Signals in Noise," *Proceedings of ICASSP-94*, Adelaide, Australia, April 1994.