Jeffrey H. Reed, Ph.D.

Willis G. Worcester Professor of ECE
The Bradley Department of Electrical and Computer Engineering
Director of Wireless at Virginia Tech
Virginia Tech
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Vitae

Section I: Experience and Education

Current Position: **Director of Wireless at Virginia Tech (Wireless@VT)**
Professor of the Bradley Department of Electrical and Computer Engineering
Named the **Willis G. Worcester Professor of ECE,** Summer 2005
Deputy Director of the Mobile and Portable Radio Research Group (MPRG)

Professional Interest: Research and teaching in signal processing and communication systems

Specific Research Interests	Specific Teaching Interests
Software Radios	Software Radios
Smart Antennas	Digital and Analog Communications
Interference Rejection	Discrete Time and Digital Signal Processing
Wireless Networks	Cellular and Personal Communications
Communication System Planning	DSP-based Communication System Design
Location Technology	Adaptive Filtering

Education:

Ph.D.
Electrical and Computer Engineering, December 1987, University of California, Davis
Awarded American Electronics Fellowship for Faculty Development
Major: Statistical Signal Processing; Minor: Control Systems and Statistics
Dissertation: *Interference Rejection Using Time-Dependent Adaptive Filters*
Attended part-time at University of Santa Clara, September 1980 through June 1983

M.S.
Electrical and Computer Engineering, June 1980, University of California, Davis

M.S. Project Topic: An EEG Data Acquisition and Analysis System

B.S.
Electrical and Computer Engineering, March 1979, University of California, Davis

Employment:

Professor, Virginia Tech, April 2001-present
Associate Professor, Virginia Tech, 1997-2001
Co-founder, Dot Mobile, Inc., March 2000-2001
Consultant, Reed Engineering (Self-Employed), 1987-present
Assistant Professor, Virginia Tech, 1992-1997
Research Engineer, University of California, Davis, 1992
Lecturer, University of California, Davis, 1988-1992
Associate Instructor, University of California, Davis, 1985-1987
Teaching Assistant, University of California, Davis, 1984-1985
Member of Technical Staff, Signal Science, Inc., Santa Clara, CA and Hanover, MD, 1980-1985

Professional Affiliations:

Member of **Tau Beta Pi Honor Society**
Member of **Phi Kappa Phi Honor Society**

Professional Awards:

Named Willis G. Worcester Professor of ECE, summer 2005
Industry Achievement Award, SDR Forum 2004
Institute of Electrical and Electronics Engineers (IEEE Fellow Dec. 2004)

Journal Reviewing Activities:

International Journal of Electronics
IEEE Transactions on Signal Processing
IEEE Transactions on Circuits and Systems
IEEE Transaction on Communications
IEEE Transactions on Selected Areas of Communications
IEEE Signal Processing Letters
IEEE Communications Magazine
International Journal on Wireless Information Networks

Funding Agency Reviewer:

NSF
University of California, MICRO
Kansas 2000

Section II: Funded Research (Principal Investigator or Co-Principal Investigator)

CT-ISG: Assuring Security in Spectrum Agile Radio Networks, NSF, 01/01/07-12/31/09, $499,997 (Reed Co-PI).

Distributed Computing for Collaborative Software Radio, Office of Naval Research, 02/05/07-02/04/10, $533,722 ($108,728 awarded first year).

A Panel of Commercial GSM Experts For Supporting JIEDDO Operations, JIEDDO, 12/18/06-2/28/07, $38,275.

Cognitive Radio Test-bed, Virginia Space Grant Consortium, 08/16/06-08/15/07, $5000.

Emerging Wireless Technologies (EWT) Technology Assessment, Rosettex, 07/03/06-12/31/07, $91,000.

Development of a Cognitive Engine and Analysis of WRAN Cognitive Radio Algorithms, ETRI, 06/16/06-12/31/06, $175,554.

Wireless@Virginia Tech Group Start-up, Institute for Critical Technology and Applied Science – ICTAS, 01/01/06-06/30/07, $500,000.

A Low-Cost All-Band/All-Mode Radio for Public Safety, National Department of Justice (Dept. of Justice), 10/01/05-09/30/08, $399,816 (Reed Co-PI).

Applying Artificial Intelligence Techniques to the Development of a Cognitive Radio Engine: Assessment, Evaluation, and Implementation, Army Research Office, 10/01/05-06/30/06, $49,995.

Analysis of WRAN Algorithms, ETRI, 10/01/05-12/31/05, $1,211,560.

NeTS PROWIN: An Open System Approach for Rapid Prototyping Waveforms for Software Defined Radios, 08/15/05-08/14/09, $999,995 (Reed Co-PI).

Cognitive Radios, Virginia Space Grant Consortium, 08/10/05-08/09/06, $5000.

A Software Defined Ultra Wideband Communication System Testbed, Virginia Space Grant Consortium, 08/10/05-08/09/06, $5000.

Advanced Wireless Integrated Network: AWINN, Office of Naval Research, 12/20/04-06/24/06, $484,200 (Reed portion).

Software Defined Radios: Evolution and Application Areas, Booz Allen Hamilton, 1/1/05-3/15/05, $74,497.

Ossie and Harriet, SAIC, 08/16/04-12/31/05, $300,519

CDMA 2000 System Modeling and Simulation Program, Magnolia Broadband, Inc.**,** 12/15/03-12/14/04, $84,500.

Policy-based Resource Management in a Vehicular Ad-Hoc Network for First Responders, Naval Postgraduate School, 09/24/03-09/30/04, $25,431.

System Level Design Approach and Methodologies For Software Defined Radios, National Imagery and Mapping Agency, 7/25/03-7/24/06, $189,282.

Smart Antennas Research At The MPRG, Army Research Office, 06/01/03-12/31/04, $37,500.

Proposal for GDDS Cluster X-SCA-Lite Architecture, General Dynamics, 05/01/03-10/31/03, $85,691.

Game Theoretic Analysis Of Radio Resource Management For Ad-Hoc Networks**,** Office of Naval Research, 04/01/03-03/31/06, $589,411.

Game Theory in Radio Resource Management*,* Motorola University Partnership in Research, 09/01/02-05/31/04, $60,000.

Software Radios and Smart Antennas: Challenges for Creating Seamless Networks Samsung Electronics, 04/08/03-05/15/04, $520,785.

UWB Propagation Measurements, Modeling, and Communication System Enhancements, DARPA, 08/16/01-12/31/03, $688,620

Tactical Communications Architecture and Implementation Plan for the U.S. Customs Service, Naval Surface Warfare Center, Dahlgren, 8/16/01-8/15/02, $402,000.

ACN Independent Innovative Research Component, Raytheon Systems, 12/1/01-11/30/02 $11,250.

Foundation Wireless Network for Medical Applications, Carilion Biomedical Institute, 8/6/01-8/10/02, $75,000.

Interference, Propagation, and Antenna Placement Issues for XM Radio, GM, 3/26/01-9/25/02, $583,527.

AOL Fellowship in Wireless Home Networking Technologies, AOL, 01/01/01-05/15/03. $84,583.

Reconfigurable Apertures and Space-Time Processing, Raytheon Systems, 05/00-09/02, $841,350.

Advanced Wireless Technology for Aerospace Communications, Virginia Space Grant Consortium, 08/00 to 05/03, $15,000.

Research and Development for IMT-2000, LG Electronics, 05/15/00 to 09/31/01, $350,000.

Motorola University Partnership in Research: Overloaded Array Processing, Motorola, 09/01/00-08/31/02, $84,944.

Multiuser Detection for Overloaded Antenna Arrays, Raytheon, 05/00 to 05/02, $1,126,194.

An Investigation of Base Station Diversity For Cellular Applications – Phase II, Metawave, 02/29/00 to 02/28/01, $104,000.

Broadband Channel-Adaptive Radio Modem for NGI Network Extension and Access, Hughes Research Laboratory, 10/01/99 to 11/30/01, $81,412.

Research Into Signal Recovery Algorithms in Support of Spectral Spatial Interference Cancellation System (SSICS) – Phase II Research Effort, Raytheon Company, 02/01/00 to 05/15/01, $149,756.

Navy Collaborative Integrated Information Technology Initiative (NAVCIITI), Office of Naval Research, 04/00 to 06/04, $9,651,087. (Reed portion $534,089.)

Research into Spatial Signal Recovery Algorithms in Support of Spectral Spatial Interference Cancellation System - Phase I (SSICS), Raytheon Company, 080/2/99 to 01/10/00, $97,857.

Low Power and Robust Communications Using Hand-Held Smart Antennas for Receiving and Transmitting, Texas Instruments, 07/01/98 to 06/30/00, $331,993.

An Investigation of Base Station Diversity for Cellular Applications, Metawave Communications, 03/01/99 to 02/28/01, $179,706.

International Wireless Communication Research Program, Virginia Tech Research and Graduate Studies' SEED Program, 01/01/99 to 06/30/00, $7,500.

Navy Collaborative Integrated Information Technology Initiative (NAVCIITI), Office of Naval Research, 11/14/98 to 09/30/00, $2,700,000.

Enhancing the Capacity of IMT-2000 Through Turbo Coding and Smart Antennas, LGIC, 10/01/98 to 09/30/99, $122,904.

Low Power and Robust Communications Using Hand-Held Smart Antennas for Receiving and Transmitting, Texas Instruments, 07/01/98 to 06/30/99, $132,000.

Techniques for Evaluating Location Technologies, Comcast, 05/01/98 to 12/31/98, $112,154.

Development of Tools for CDMA Cellular Network Planning, Innovative Global Solutions (IGS), 04/01/98 to 01/31/99, $42,889.

Configurable and Robust Wireless Communications Nodes, DARPA, 07/01/97 to 12/30/00, $2,015,431.

Support of Telelink System Test, Global-Net, Inc., 09/25/96 to 09/24/97, $50,000.

Sprint RFI and Evaluation, Sprint Spectrum L. P., 09/26/96 to 12/31/96, $31,158.

Rural MayDay/800 Call-in System Feasibility, I-95 Corridor Coalition/ Virginia Department of Transportation, 02/01/96 to 01/31/97, $299,176 (MPRG share $157,988).

A Study of Reconfigurable Receivers for Cellular and PCS, Texas Instruments, 08/25/95 to 08/25/96, $35,000.

CDMA/FM Evaluation Effort, Comdial Corporation/Sigtek, 08/28/95 to 12/31/95, $25,000 (plus $7,500 CWT match)

Measured DECT System Performance in Actual Radio Channels, National Semiconductor, 10/01/94 to 2/15/96, $35,024

Investigation of BMP Impacts on Nonpoint Source Pollution Using System Analysis Procedures, Virginia Water Resource Center/U.S. Dept. of Interior, 04/01/95 to 04/30/96, $9,963

Development and Implementation Of Interference Rejection Techniques for Cellular Communications, SAIC, Center for Wireless Telecommunications (CWT), $50,000 (SAIC, 03/22/95 to 12/31/95) $25,000 (CWT, 07/01/95 to 06/31/96).

Expanded Testing of a High Capacity Adaptive Wireless Receiver, ARPA/AASERT, 08/01/95 to 07/31/98, $125,522.

Co-Channel Interference Rejection for FM Mobile Phone Systems, Motorola, 01/16/95 to 09/15/95, $33,000

A High Capacity Wireless Receiver Implemented with A Reconfigurable Computer Architecture, ARPA/WAMIS, 09/94 to 08/30/97, $1,727,230 ($533,250 for the first year, $586,750 second year).

Development of a Low Power High Data Rate Spread-Spectrum Modem, Grayson Electronics, Virginia's Center for Innovative Technology (CIT), Center for Wireless Telecommunications (CWT), $29,833 (Grayson, 03/01/94 to 11/30/94), $13,204 (CIT, 03/01/94 to 10/31/94) and $16,000 (CWT matching funds, 04/01/94 to 06/30/95).

Rejection of Interference in AMPS Cellular Communication, ARGOSystems, VA's Center for Innovative Technology (CIT), $25,000 (ARGOSystems, 12/10/93 to 05/10/94) and $12,500 (CIT, 04/01/94 to 07/31/94)

Capacity and Interference Resistance of Spread-Spectrum Automatic Vehicle Monitoring Systems in the 902-928 MHz Band, Southwestern Bell Mobile Systems, 10/01/93 to 08/15/94, $70,007

University Road Connection - A Smart Highway, Virginia Dept. of Transportation, 07/01/94 to 11/01/94, $19,523.79

Development of a Spread Spectrum Transceiver for the DECT System, National Semiconductor, 07/01/94 to 06/30/95, $30,000

Investigation of a Dynamic Range Enhancer for an Electro-optic Interface, Southwestern Bell Technology Resources, Inc., 08/01/93 to 06/01/94, $45,000

IVHS Research Center of Excellence, Federal Highway Administration (FHWA), 1993 to 1998, $1 million/year for 5 years (MPRG total approximately $390,000 over performance period, $330,000 received in 93-94, 94-95, 95-96, 96-97 contract years).

Center for Wireless Communications, Center for Innovative Technology, 09/01/93 to 08/31/98, $300,000 for first year. Anticipated total funding approximately $1,490,835 plus an additional $357,551 of cost sharing by Virginia Tech.

The Performance and Feasibility of Time-Dependent and Non-Linear Adaptive Filters for Rejecting High-Power Co-Located Co-Channel Interference*,* US Navy via Systems Research Center, 05/15/93 to 09/01/93, Amount: 1/2 summer session support (value approximately $3,750).

Evaluation of an NTP-Based Protocol for Paging and Advanced Data Services*,* MobileComm, 07/01/93 to 09/30/93, $39,986

Grants and Gifts:

Monetary Grants and Gifts:

Texas Instruments, 06/13/06, un-restricted research, $49,500

Wireless@VT Industrial Affiliates Membership 2006-2007: Total paid $117,500 and an additional $37,500 committed to date. Services provided to sponsors include advanced copies of thesis and dissertations, informal consulting, and special opportunities to employ students.

Tektronix, 12/05, un-restricted research, $20,000

Texas Instruments, 08/05, un-restricted research, $27,519

Tektronix, 07/05, un-restricted research, $20,000

Texas Instruments. 12/02/2004, un-restricted research, $99,000

Tektronix, spring 2004, un-restricted research, $20,000

CISCO Systems, 08/20/03 and 2/10/05, un-restricted research, $176,000 ($88,000 each increment)

Mercury Computer Systems, Inc., 2003, un-restricted research, $50,000.

Analog Devices**,** 2001-2002*,* un-restricted research, $37,500.

HRL, ***Smart Antenna Research,*** 2000, $40,000

Flexible Communications Using Reconfigurable Computing, Rockwell, 1998, $25,000

Investigation of CDMA, donation from ITT, December 1996, $100,000.

Curriculum Innovation for Simulation and Design of Wireless Communications Systems*,* National Science Foundation, 8/16/95 to 7/31/98, $289,291.

MPRG Industrial Affiliates Membership 1993-2006: Grant total split between the five MPRG faculty (total paid $4,866,500 and an additional $110,000 committed to date). Services provided to sponsors include advanced copies of thesis and dissertations, informal consulting, and special opportunities to employ students.

Equipment Grants and Gifts:

Tektronix, Arbitrary Waveform Generator, February 2007, $138,000.

Xilinx, Inc., Xilinx System Generator, ChipScope Pro, Xilinx Real-PCI interface, AccelDSP Synthesis Tool with AccelWare DSP IP Toolkits, VLYNQ Interface LogiCORE, ISE Foundation, University Option Embedded Development Kit, January 2007, $39,615.

Tektronix, equipment $114,000

Mercury Systems, AdapDEV 1280 Chassis with 900 MHz processor, August 2003

Spectrum Signal Processing, Inc., Hardware necessary to implement a true software defined radio, 8/2002, $62,329.

Grayson Wireless, Cellular test and measurement system, 8/2002, $66,312

Signia-IDT (formerly BAE), RF Front-end valve, 2002, ~$6000

Altera, MAX + Plus II Fixed Node Subscription (FPGA board), $2,000.

Texas Instruments, Evaluation Module incl. Code Composer Studio, 6/2001, $19,960

Texas Instruments, ADC-Converter, 3/2001, $99

Analog Devices, Evaluation Boards (5), Visual DSP software (2), In-Circuit Emulators (2), $3,790

Wireless Valley Communications, 2001, 2 copies SitePlanner w/LanFielder $49,980, 1 copy SiteSpy on SMT $995, $50,975

Analog Devices, receiver, processor, and receiver chip set, $645

Texas Instruments, boards, 2001, $2,495

HRL, 2000, Diversity Antenna, $200

Altera, development package, 2000, $995

Altera, (2) MAX+ PLUS II Fixed Node Subscription for PC, (1) design lab package, (1) Micro-Chip; $4,765.

Motorola, 56311EVM computer board with DSP and 56311 on it, software, documentation, tutorial, and input/output capabilities, 12/2000, $2000

Texas Instruments, Evaluation software and manuals, 1998, $2,500

Texas Instruments, Evaluation Software, 1997, $1,000

Altera, Development Tools for Programming Configurable Logic Devices, $350

Texas Instruments, DSP Development Systems and Software, 1997, $11,475

Texas Instruments, DSP Hardware and Software, 1997, $27,500

Analog Devices, DSP Development Boards, 1996, $3,200

Altera, Software Materials, 1996, $5,000

SIGTEK, Spread Spectrum Receivers, 1995, $10,000

Section III. Teaching and Advising

Classes Taught:

Graduate Courses

Cellular and Personal Communications (ECE6644)
Software Radios: A Modern Approach to Radio Engineering (ECE5674)
Digital Signal Processing (ECE5624)

Undergraduate Courses

Implementation of Communication Systems (ECE4654)
Signal Processing (ECE4624)
Communication Systems (ECE3604)

Courses Developed:

Implementation of Communication Systems (ECE 4654)
(Lab materials also developed)
Software Radios (ECE 5674)

Advising: **Completed Ph.D. Dissertations**

Youping Zhao, *Enabling Cognitive Radios through Radio Environment Maps*, May 2007

Rekha Menon, *Interference Avoidance based Underlay Techniques for Dynamic Spectrum Sharing*, April 2007

Jong-Han Kim, *On the Impact of MIMO Implementations on Cellular Networks: An Analytical Approach from a System Perspective,* March 2007

Ramesh Chembil Palat, *Performance Analysis of Cooperative Communications for Wireless Networks,* December 2006

Jody Neel, *Analysis and Design of Cognitive Radio Networks and Distributed Radio Resource Management Algorithms,* September 2006

Chris Anderson, *A Software Defined Ultra Wideband Transceiver Testbed for Communications, Ranging, or Imaging*. September 2006

James Hicks, *Novel Approaches to Overloaded Array Processing,* August 2003

Raqibul Mostafa, *Feasibility of Smart Antennas for the Small Wireless Terminals*, April 2003

William Newhall, *Radio Channel Measurements and Modeling for Smart Antenna Array Systems Using a Software Radio Receiver,* April 2003

Pablo Max Robert, *Reduction in Coexistent WLAN Interference Through Statistical Traffic Management*, April 2003

Tom Biedka, *Analysis and Development of Blind Adaptive Beamforming Algorithms*, August 2001

Srikathyayani Srikanteswara, *Design and Implementation of a Soft Radio Architecture for Reconfigurable Platforms*, July 2001

Rich Ertel, *Antenna Array Systems: Propagation and Performance*, July 1999

Nitin Mangalvedhe, *Development and Analysis of Adaptive Interference Rejection Techniques for Direct Sequence Code Division Multiple Access Systems*, July 1999

Nishith Tripathi, *Generic Handoff Algorithms Using Fuzzy Logic and Neural Networks*, November 1997

Paul Petrus, *Novel Adaptive Array Algorithms and Their Impact on Cellular System Capacity,* April 1997.

Jeff Laster, *Robust GMSK Demodulation Using Demodulator Diversity and BER Estimation,* January 1997

Rong He, *AMPS Co-Channel Interference Rejection Techniques and their Impact on System Capacity,* August 1996

Current Ph.D. Students

Carlos Aguayo, Expected Completion Date June 2008

Joseph Gaeddert, Expected Completion Date August 2008

Kyou Woong Kim, Expected Completion Date December 2007

Lizdabel Morales, Expected Completion Date May 2008

Hazem Sarwat Shatila, Expected Completion Date May 2008 (co-advised)

Yash Vasavada, Expected Completion Date December 2008

Completed M.S. Theses

Jacob DePriest, *A Practical Approach to Rapid Prototyping of SCA Waveforms,* April 2006

Srinivasan Vasudevan, *A Simulation for Analyzing the Throughput of IEEE 802.11b Wireless LAN Systems,* Jan. 2005

Brian Donlan, *Ultra-wideband Narrowband Interference Cancellation and Channel Modeling for Communications*, Jan. 2005

Anil Hebbar, *Empirical Approach for Rate Selection in MIMO OFDM*, Dec. 2004

Seshagiri Krishnamoorthy, *Interference Measurements and Throughput Analysis for 2.4 GHz Wireless Devices in Hospital Environments*, Apr. 2003.

Yasir Ahmed*, A Model-Based Approach to Demodulation of Co-Channel MSK Signals,* Dec. 2002.

Ramesh Chembil Palat, *VT-Star – Design and implementation of a test bed for differential space-time block coding and MIMO channel measurements*, October 2002.

Jody Neel, *Simulation of an Implementation and Evaluation of the Layered Radio Architecture*, Dec. 2002

Bing-Leung (Patrick) Cheung, *Simulation of Adaptive Algorithms for OFDM and Adaptive Vector OFDM Systems*, August 2002.

Shakheela H. Marikar, *Resource Management in 3G Systems Employing Smart Antennas,* Jan. 2002

M. Soni, *Computing Engine for Reconfigurable Software Radio*, Oct. 2001

Christian Rieser, *Channel Sounder for LMDS*, May 2001(co-advisor)

James Hicks, *Overloaded Array Processing with Spatially Reduced Search Joint Detection,* May 2000.

Zhong Hu, *Evaluation of Joint AOA and DOA Estimation Algorithms Using the Antenna Array Systems,* May 1999.

Kim Phillips, *Probability Density Function Estimation for Minimum Bit Error Rate Equalization,* May 1999.

Pablo (Max) Robert, *Simulation Tool and Metric for Evaluating Wireless Digital Video Systems*, May 1999.

Steven F. Swanchara, *An FPGA-Based Multiuser Receiver Employing Parallel Interference Cancellation,* July 1998.

Don Breslin, *Adaptive Antenna Arrays Applied to Position Location*, August 1997.

Steve Nicoloso, *Investigation of Carrier Recovery Techniques for PSK Modulated Signals in CDMA and Multipath Mobile Environments*, May 1997.

Brian Fox, *Analysis and Dynamic Range Enhancement of the Analog-to-Digital Interface in Multimode Radio Receivers*, February 1997.

Nena Zecevic, *Interference Rejection Techniques for the Mobile Unit Direct-Sequence CDMA Receiver,* August 1996.

Kevin Saldanha, *Performance Evaluation of DECT in Different Radio Environments,* August 1996.

Milap Majmundar, *Adaptive Single-User Receivers for Direct Sequence CDMA Systems,* February 1996.

Yash Vasavada, *Performance Evaluation of a Frequency Modulated Spread Spectrum System,* February 1996.

Scott Elson, *Simulation and Performance Analysis of CDPD,* January 1996.

Matthew Welborn, *Co-channel Interference Rejection Using Model-based Demodulator,* January 1996.

Francis Dominique, *Design and Development of a Frequency Hopper Based on the Dect System for the 902-928 MHz ISM Band*, December 1995.

Nitin Mangalvedhe*, An Eigenstructure Technique for Direct Sequence Spread Spectrum Synchronization*, April 1995.

Paul Petrus, *Blind Adaptive Arrays for Mobile Communications*, December 1994.

Sihano (Raymond) Zheng, *Channel Modeling and Interference Rejection for CDMA Automatic Vehicle Monitoring Systems*, November 1994.

Fu-Sheng (Frank) Cheng, *A New Approach to Dynamic Range Enhancement*, September 1994.

Volker Aue, *Optimum Linear Single User Detection In Direct-Sequence Spread-Spectrum Multiple Access Systems*, March 1994.

Completed M.S. Projects

Sujayeendar Sachindar, May 2000.

Saffet Bayram, December 2000.

Kazi Zahid, December 2000.

Ariful Hanan, August 2000.

Kau Yao, October 1994.

Mala Subramanian, August 1994.

Tahir Qazi, March 1994.

Allen Alexander

Shankari Panchapakesan

Current M.S. Students

Phillip Balister, Expected Completion Date May 2008

Andrew Cormier, Expected Completion Date May 2008 (co-advised with William Tranter)

Tom Tsou, Expected Completion Date December 2007

Section IV. Publications List

Books Authored or Co-Authored

1. Jeffrey H. Reed, editor, "An Introduction to Ultrawideband Communications Systems'" published by Prentice Hall, March 2005, ISBN: 0-13-148103-7.

2. Jeffrey H. Reed, *Software Radio: A Modern Approach to Radio Design*, May 2002, Prentice Hall, ISBN 0-13-081158-0.

3. Nishith D. Tripathi, Jeffrey H. Reed, Hugh F. VanLandingham, *"Radio Resource Management in Cellular Systems,"* Kluwer Academic Publishers, Spring 2001

Books Edited

1. W. H. Tranter, B. D. Woerner, J. H. Reed, T. S. Rappaport, and P. M. Robert, *Wireless Personal Communications – Bluetooth and Other Technologies,* Kluwer Academic Publishers, 2000.

2. W. H. Tranter, B. D. Woerner, T. S. Rappaport, and J. H. Reed, *Wireless Personal Communications – Channel Modeling and Systems Engineering*, Kluwer Academic Publishers, 1999, 253 pages.

3. W. H. Tranter, T. S. Rappaport, B. D. Woerner, J. H. Reed, editors, *Wireless Personal Communications: Emerging Technologies for Enhanced Communications*, Kluwer Press, 1998, 329 pages.

4. T. S. Rappaport, B. D. Woerner, J. H. Reed, W. H. Tranter, editors, *Wireless Personal Communications: Improving Capacity, Services, and Reliability*, Kluwer Press, 1997, 225 pages.

5. J. H. Reed, B. D. Woerner, T. S. Rappaport, editors, *Wireless Personal Communications: Advances in Coverage and Capacity*, Kluwer Press, 1997, 223 pages.

6. T. S. Rappaport, B. D. Woerner, J. H. Reed, editors, *Wireless Personal Communications: The Evolution of PCS*, Kluwer Press, 1996, 216 pages.

7. B. D. Woerner, T. S. Rappaport, J. H. Reed, editors, *Wireless Personal Communications: Research Developments*, Kluwer Press, 1995, 295 pages.

8. T. S. Rappaport, B. D. Woerner, J. H. Reed, editors, *Wireless Personal Communications: Trends and Challenges*, Kluwer Press, 1994, 266 pages.

Book Contributions

1. Youping Zhao, Bin Le, Jeffrey Reed, "Network Support: The Radio Environment Map", chapter written for *"Cognitive Radio Technology" by Bruce Fette*, published August 8, 2006 by Elesvier Inc., pp. 337-363 , ISBN: 978-0-7506-7952-7.

2. James O. Neel, Jeffrey H. Reed, Allen B. MacKenzie, "Cognitive Radio Performance Analysis," chapter written for *"Cognitive Radio Technology" by Bruce Fette*, published August 8, 2006 by Elesvier Inc., pp. 501-579 , ISBN: 978-0-7506-7952-7.

3. Brian M. Donlan, R. Michael Buehrer, Jeffrey H. Reed, "Ultra-wideband Wireless Systems," published in the Encyclopedia of RF and Microwave Engineering, Spring 2005, pp. 5411-5423, ISBN: 0-471-27053-9.

4. N. D. Tripathi, J.H. Reed, H.F. VanLandingham, chapter titled, "Application of a Neurofuzzy System to Handoffs in Cellular Communications," written for *"Neuro-Fuzzy and Fuzzy-Neural Applications in Telecommunications (Signals and Communication Technology)" by Peter Stavroulakis,* published May 14, 2004 by Springer Publishing, ISBN: 3540407596.

5. J. H. Reed, and C. J. Rieser, "Software Radio: Technical, Business and Market Implications," *World Market Series Business Briefing Wireless Technology 2001,* WMRC PLC – World Markets Research Centre, ISBN 1-903140-36-1, October 2000, pp. 146-150.

6. P. Petrus and J. H. Reed, "Co-channel Interference in Wireless Communication Systems," *Encyclopedia of Electrical and Electronics Engineering*, John Wiley & Sons, Inc., February 1999 (invited paper).

7. N. R. Mangalvedhe and J. H. Reed, "Analysis of an Eigenstructure Technique for DSSS Synchronization," *Wireless Personal Communications: The Evolution of PCS*, Kluwer Press, 1996 (also appears in *Virginia Tech's Sixth Annual Symposium on Wireless Personal Communications*, June 1996), pp. 201-214.

8. J. D. Laster and J. H. Reed, "A Survey of Adaptive Single Channel Interference Rejection Techniques for Wireless Communications," *Wireless Personal Communications: Research Developments*, Kluwer Press, 1995 (also appears in *Virginia Tech's Fourth Annual Symposium on Wireless Personal Communications*, June 1994), pp.29-54.

9. I. Howitt, J. H. Reed, V. Vemuri, T.C. Hsia, "Recent Developments In Applying Neural Nets to Equalization And Interference Rejection," *Wireless Personal Communications: Trends and Challenges*, Kluwer Press, 1994 (also appears in *Virginia Tech's Third Symposium on Wireless Personal Communications*, June 1993), pp.49-58.

Papers in Refereed Journals

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1. Shiwen Mao, Xiaolin Cheng, Y.T. Hou, H. D. Sherali, J. H. Reed, "On Joint Routing and Server Selection for MD Video Streaming in Ad Hoc Networks," published in the *IEEE Transactions on Wireless Communications*, January 2007, Vol. 6, Issue 1, pp. 338-347.

2. Carlos Aguayo Gonzalez, Francisco Portelinha, Jeffrey H. Reed, part 1 published in the *Military Embedded Systems Magazine*, March/April 2007 Issue. Part 2 published in the May/June 2007 Issue.

3. Nankyu Ryu, Yusuk Yun, Seung Won Choi, R. Chembil Palat, Jeffrey H. Reed, "Smart Antenna Base Station Open Architecture for SDR Networks," published in the *IEEE Wireless Communications*, June 2006, Vol. 13, Issue 3, pp. 58-69.

4. L. daSilva, G.E. Morgan, C.W. Bostian, S.F. Midkiff, J.H. Reed, C. Thompson, W.G. Newhall, and B.D. Woerner, "The Resurgence of Push-To-Talk Technologies," published in the *IEEE Communications Magazine*, January 2006, Vol. 44, No. 1, pp. 48-55.

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Papers, Talks, and Lectures Presented at Professional Meetings

1. Jeffrey H. Reed, "Distributed Computing in Collaborative Software Radio," presented to the Office of Naval Research, May 1, 2007.

2. Jeffrey H. Reed, "Issues in Cognitive Wireless Networks," talk presented at the Intel Research Forum and Seminar Series, Portland, OR, March 28, 2007.

3. Jeffrey H. Reed, "Issues in Cognitive Wireless Networks," talk presented at NIST, March 2, 2007.

4. Jeffrey H. Reed, "Understanding the Issues in Software Defined Cognitive Radios," seminar presented at the University of Pennsylvania, October 16, 2006.

5. Jeffrey H. Reed, "Issues in Cognitive Wireless Networks," talk presented at the IEEE Workshop on Networking Technologies for Software Defined Radio (SDR) Networks, (Held in conjunction with SECON 2006), Reston, VA, September 25, 2006.

6. Jeffrey H. Reed, "Applications of Markov Modeling to Cognitive Radio," presented at the SASDCRT conference, Naval Post Graduate School, Monterey, CA, September 12-13, 2006.

7. Jeffrey H. Reed, "Understanding the Issues in Software Defined Cognitive Radios," seminar presented at Clemson University, SC, July 21, 2006.

8. Jeffrey H. Reed, "Understanding the Issues in Software Defined Cognitive Radios," seminar presented at Kyung Hee University, Korea, June 12, 2006.

9. Jeffrey H. Reed, "Open Architecture Bridging the gap in Emergency Communications," guest speaker at the 2006 International Wireless Communications Expo – IWCE conference and Tektronix Symposium, Las Vegas, NV, May 19, 2006.

10. Jeffrey H. Reed, "An Introduction to Cognitive Radio and some Research Trends in Cognitive Radios," presented talk at ETRI Cognitive Radio Workshop, Seoul, Korea, April 2006.

11. J.H. Reed, "Key Challenges in the Design on Software Radios," workshop presented at the IDGA Software Radio conference in Alexandria, Va., February 23, 2004.

12. J.H. Reed, "Issues in Software Radios," presented at Microsoft, Seattle, WA, Mar. 3, 2003.

13. J.H. Reed, "Wireless Convergence Paradox," presented at Samsung Telecom Forum, Seoul, Korea, Mar. 16-23, 2003.

14. J. H. Reed, S. Srikanteswara, J.A. Neel, "Design Choices for Software Radios," presented as tutorial at the SDR Forum, San Diego, CA Nov. 8-14, 2002, also on DVD through the SDR Forum web site at http://sdrforum.org/store.html.

15. W.H. Tranter, J.H. Reed, D.S. Ha, D. McKinstry, R. M. Buehrer, J. Hicks, "High Capacity Communications Using Overloaded Array," presented at *COMMTEC 2002*, September 16-20, 2002, Chantilly, VA.

16. R.M. Buehrer, J.H. Reed, "Robust Ad-Hoc, Short-Range Wireless Networks for Tracking and Monitoring Devices," presented to the *Marine Corp.*, April 2002.

17. J.H. Reed, "Overloaded Array Processing with Spatially Reduced Search Joint Detection," presented at the *Dresden University of Technology*, September 24, 2001.

18. B. Kim, W. L. Stutzman, D. G. Sweeney, and J. H. Reed, "Space, Polarization, and Angle Diversity for Cellular Base Stations Operating in Urban Environments," *2000 IEEE Antennas and Propagation International Symposium,* Salt Lake City, UT, pp. 940-943, July 16-21, 2000.

19. B. Kim, W. L. Stutzman, D. G. Sweeney, and J. H. Reed, "Initial Results from an Experiemental Cellular Base Station with Space, Polarization, and Angle Diversity Operating in Urban Environments," *10th Virginia Tech/MPRG Symposium on Wireless Personal Communications,* Blacksburg, VA, June 14-16, 2000.

20. Dr. Reed presented an invited lecture series to several Korean companies, compliments of Samsung Advanced Institute of Technologies. The list of companies included: Samsung, LGIC, and ETRI. Spring 2000.

21. J. H. Reed, "The Future of Wireless," invited talk, Atlantic City, NJ, November 15, 1999.

22. J. H. Reed, "Software Radios," Motorola Futures Forum, invited talk to corporate strategists, Pheonix, AZ, November 8, 1999.

23. P. Robert and J. H. Reed, "Digital Video Transmissions in a Wireless System," *Ninth Annual Symposium on Wireless Personal Communications*, Virginia Tech, June 1997 (poster session).

24. M. Hosemann and J. H. Reed, "Synchronization Techniques for Spread Spectrum Signals," *Eighth Annual Symposium on Wireless Personal Communications*, Virginia Tech, June 1997 (poster session).

25. S. Srikanteswara, and J. H. Reed, "Development of a Software Radio Architecture Using Recongifurable Computing," *Eighth Annual Symposium on Wireless Personal Communications*, Virginia Tech, June 1997 (poster session).

26. J. Hicks, P. Roy, J. Tilki, L. Beex, J. Reed, and W. Farley, "Simulation Tool for Speech Recognition over Wireless," *Eighth Annual Symposium on Wireless Personal Communications*, Virginia Tech, June 1997 (poster session).

27. R. Ertel and J. Reed, "Optimum SINR Antenna Array Performance Analysis," *Eighth Annual Symposium on Wireless Personal Communications*, Virginia Tech, June 1997 (poster session).

28. R. Banerjee, B. Woerner and J. Reed, "Case Studies in Software Radios," *Eighth Annual Symposium on Wireless Personal Communications*, Virginia Tech, June 1997 (poster session).

29. P. M. Robert, A. M. Darwish, and J. H. Reed, "Fast Bit Error Generation for the Simulation of MPEG-2 Transmissions in Wireless Systems," invited presentation, IEEE Wireless Communications and Networking Conference 1999, New Orleans, LA, proceedings on CD Rom, September 21-24, 1999.

30. J. H. Reed and Srikathyayani Srikanteswara, "Software Radio Architecture for a Reconfigurable Computing Platform," presented at the *IEEE Communications Theory Workshop*, Aptos, CA, May. 23-26, 1999.

31. R. Ertel , Z. Hu and J. H. Reed, "Antenna Array Vector Channel Modeling and Data Collection System," *Eighth Annual Symposium on Wireless Personal Communications*, Virginia Tech, June 1997 (poster session).

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33. S. Swanchara, S. Srikanteswara, P. Athanas, and J. H. Reed, "Implementation of a Multiuser Receiver on a Recongifugurable Computing Platform," *Eighth Annual Symposium on Wireless Personal Communications*, Virginia Tech, June 1997 (poster session).

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35. K. Phillips and J. H. Reed, "PDF Estimation," *Eighth Annual Symposium on Wireless Personal Communications*, Virginia Tech, June 1997 (poster session).

36. N. Mangalvedhe and J. H. Reed, "Performane of Reduced Complexity Algorithms in Adaptive CDMA Receivers," *Eighth Annual Symposium on Wireless Personal Communications*, Virginia Tech, June 1997 (poster session).

37. R. Mostafa, J. H. Reed, "Study of Smart Antenna as an Interference Rejection Technique for the Handset," *Eighth Annual Symposium on Wireless Personal Communications*, Virginia Tech, June 1997 (poster session).

38. N. Mangalvedhe and J. H. Reed, "Adapative Receivers for Multi-Rate DS-CDMA Systems," *Eighth Annual Symposium on Wireless Personal Communications*, Virginia Tech, June 1997 (poster session).

39. J. H. Reed and B. D. Woerner, "Analog to Digital Conversion and Digital Signal Synthesis for Software Radios," a half-day tutorial presented at the *IEEE Ninth International Symposium on Personal, Indoor, and Mobile Radio Communications*, Boston, MA, September 13-16, 1998 (invited tutorial).

40. J. H. Reed, "The Software Radio: Modern Radio Engineering," Dresden University of Technology Guest Lecture, Dresden, Germany, November 25, 1997.

41. J. H. Reed, "Adaptive Antenna Arrays," Dresden University of Technology Guest Lecture, Dresden, Germany, November 26, 1997.

42. J. H. Reed, "Overview of Fundamental Wireless Systems In Today's Telecommunications Technology," *46th Annual International Wire and Cable Symposium*, Philadelphia, PA, November 17-20, 1997 (invited tutorial).

43. J. H. Reed and R. D. James, "Position Location: Overview and Business Opportunities," *Wireless Opportunities Workshop*, Roanoke, VA, October 22-23, 1997.

44. R. Ertel and J. H. Reed, "Geometrically Based Spatial Channel Modles," *Seventh Annual Symposium on Wireless Personal Communications*, Virginia Tech, June 1997 (poster session).

45. A. Hannan and J. H. Reed, "GloMo Radio API (Application Program Interface," *Seventh Annual Symposium on Wireless Personal Communications*, Virginia Tech, June 1997 (poster session).

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47. N. D. Tripathi, J. H. Reed and H. VanLandingham, "High Performance Handoff Algorithms Using Fuzzy Logic and Neural Networks," *Seventh Annual Symposium on Wireless Personal Communications*, Virginia Tech, June 1997 (poster session).

48. D. Breslin and J. H. Reed, "Multi-Sensor Testbed Hardware Development at the Mobile and Portable Radio Resesarch Group, *Seventh Annual Symposium on Wireless Personal Communications*, Virginia Tech, June 1997 (poster session).

49. N. Mangalvedhe and J. H. Reed, "Blind CDMA Interference Rejection in Multipath Channels," *Seventh Annual Symposium on Wireless Personal Communications*, Virginia Tech, June 1997 (poster session).

50. K. Phillips, J. Laster and J. H. Reed "Adaptive Signal Processing by Bit Error Rate (BER) Estimation," *Seventh Annual Symposium on Wireless Personal Communications*, Virginia Tech, June 1997 (poster session).

51. T. S. Rappaport, J. H. Reed, T. E. Biedka, "Position Location & E-911: Techniques for Wireless Systems," invited tutorial, *IEEE International Conference on Universal Personal Communications*, Cambridge, MA, October 1, 1996 (invited tutorial).

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59. N. Tripathi, J. H. Reed, and H. VanLandingham, "Neural Net & Fuzzy Logic Approaches to Handoffs in Cellular Systems," *Sixth Annual Symposium on Wireless Personal Communications*, Virginia Tech, June 1996 (poster session).

60. K. Saldanha and J. H. Reed, "Performance Evaluation of an AMPS Digital Base Station with Automatic Gain Control," *Sixth Annual Symposium on Wireless Personal Communications*, Virginia Tech, June 1996 (poster session).

61. R. He and J. H. Reed, "System Capacity Improvement by Using DSP Interference Rejection Techniques," *Sixth Annual Symposium on Wireless Personal Communications*, Virginia Tech, June 1996 (poster session).

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65. M. Majmundar and J. H. Reed, "Interference Rejection for IS-54," *Fifth Annual Symposium on Wireless Personal Communications,* Virginia Tech, June 1995 (poster session).

66. D. Bailey and J. H. Reed, "MPRG: Signal Processing and Communications Laboratory," *Fifth Annual Symposium on Wireless Personal Communications,* Virginia Tech, June 1995 (poster session).

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68. N. Mangalvedhe and J. H. Reed, "An Eigenstructure Technique for Soft Synchronization of DSSS Signals," *Fifth Annual Symposium on Wireless Personal Communications*, Virginia Tech, June 1995 (poster session).

69. M. Welborn and J. H. Reed, "Interference Rejection Using Model-Based Spectral Estimation," *Fifth Annual Symposium on Wireless Personal Communications,* Virginia Tech, June 1995 (poster session).

70. Ashwin Amanna, Robert James, and J. H. Reed, "Communications On the Smart Road," *Fifth Annual Symposium on Wireless Personal Communications,* Virginia Tech, June 1995 (poster session).

71. F. Dominique and J. H. Reed, "Development of a Frequency Hopping System for the 902-928 MHz ISM Band," *Fifth Annual Symposium on Wireless Personal Communications*, Virginia Tech, June 1995 (poster session).

72. S. Elson and J. H. Reed, "Modeling CDPD," *Fifth Annual Symposium on Wireless Personal Communications,* Virginia Tech, June 1995 (poster session).

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76. R. He and J. H. Reed, "Spectral Correlation of AMPS Signals with Applications to Interference Rejection," *Fourth Annual Symposium on Wireless Personal Communications*, Virginia Tech, June 1994 (poster session).

77. R. Zheng and J. H. Reed, "System Modeling and Interference Rejection for Spread Spectrum CDMA Automatic Vehicle Monitoring Systems," *Fourth Annual Symposium on Wireless Personal Communications*, Virginia Tech, June 1994 (poster session).

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MPRG Technical Reports

1. Youping Zhao, "Enabling Cognitive Radios through Radio Environment Maps," MPRG-TR-07- Ph.D. Dissertation, May 8, 2007.

2. Rekha Menon, Jeffrey H. Reed, "Interference Avoidance based Underlay Techniques for Dynamic Spectrum Sharing," MPRG-TR-07- , Ph.D. Dissertation, April 30, 2007.

3. Johg-Han Kim, Jeffrey H. Reed, "On the Impact of MIMO Implementations on Cellular Networks: An Analytical Approach from a System Perspective," MPRG-TR-07-, Ph.D. Dissertation, March 19, 2007.

4. Ramesh Chembil Palat, Jeffrey H. Reed, "Performance Analysis of Cooperative Communications for Wireless Networks," MPRG-TR-06-, Ph.D. dissertation, December 8, 2006.

5. James Neel, Jeffrey H. Reed, "Analysis and Design of Cognitive Radio Networks and Distributed Radio Resources Management in Algorithms," MPRG-TR-06-14, Ph.D. Dissertation, September 2006.

6. Christopher Anderson, Jeffrey H. Reed, "A Software Defined Ultra Wideband Transceiver Testbed for Communications, Ranging, and Imaging," MPRG-TR-06-13, Ph.D. Dissertation, September 2006.

7. Christopher Anderson, Swaroop Venkatesh, Deepak Agarwal, R. Michael Buehrer, Peter Athanas, Jeffrey H. Reed, "Time Interleaved Sampling of Impulse Ultra Wideband Signals: Design Challenges, Analysis, and Results," MPRG-TR-06-12, Technical Report, August 2006.

8. Jong-Han Kim, Jeffrey H. Reed, "Efficacy of Transmit Smart Antenna at Mobile Station in Cellular Networks," MPRG-TR-06-09, Ph.D. preliminary, May 2006.

9. Jacob A. DePriest, Dr. Jeffrey H. Reed, "A Practical Approach to Rapid Prototyping of SCA Waveforms," MPRG-TR-06-06, M.S. Thesis, April 2006.

10. Brian Michael Donlan, Dr. R. Michael Buehrer, Dr. Jeffrey H. Reed, "Ultra-Wideband Narrowband Interference Cancellation and Channel Modeling for Communications," MPRG-TR-05-02, M.S. Thesis, January 2005

11. Srinivasan Vasudevan, Dr. Jeffrey H. Reed, "A Simulator for Analyzing the Throughput of IEEE 802.11b Wireless LAN Systems," MPRG-TR-05-01, Masters Theses, January 2005

12. Anil Madhava Hebbar, Dr. Jeffrey H. Reed, "Empirical Approach for Rate Selection in MIMO OFDM," MPRG-TR-04-11, M.S. Theses, December 2004.

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14. James Hicks, J.H. Reed, "Novel Approaches to Overloaded Array Processing," MPRG-TR-03-19, Ph.D. Dissertation, August 2003.

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16. Seshagiri Krishnamoorthy, J.H. Reed, "Interference Measurements and Throughput Analysis for 2.4 GHz Wireless Devices in Hospital Environments," MPRG-TR-03-10, M.S. Thesis, April 2003.

17. Pablo M. Robert, J.H. Reed, "Reduction in Coexistent WLAN Interference Through Statistical Traffic Management, MPRG-TR-03-09, Ph. D. Dissertation, April 2003.

18. William G. Newhall, J.H. Reed, "Radio Channel Measurements and Modeling for Smart Antenna Array Systems Using a Software Radio Receiver," MPRG-TR-03-08, Ph.D. Dissertation, April 2003.

19. Yasir Ahmed, J.H. Reed, "A Model-based Approach to Demodulation of Co-Channel MSK Signals," MPRG-TR-02-24, M.S. Thesis, December 2002.

20. Ramesh Chembil Palat, J.H. Reed, "VT-STAR Design and Implementation of a Test Bed Space-time Block Coding and MOMI Channel Measurements," MPRG-TR-02-19 M.S. Thesis, October 2002.

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23. Raqibul Mostafa, Ran Gozali, William Newhall, Ishan Akbar, Jeffrey H. Reed, Brian D. Woerner, William H. Tranter, "Navy Collaborative Integrated Information Technology Initiative," report #19, MPRG-TR-02-13, Technical Report, April 2002.

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32. Srikathyayani Srikanteswara, Jeffrey H. Reed, "Design and Implementation of a Soft Radio Architecture for Reconfigurable Platforms," MPRG-TR-01-10, Dissertation, July 2001.

33. Raqibul Mostafa, Jeffrey H. Reed, "Feasibility of Transmit Smart Antenna at the Handset," MPRG-TR-01-07, PhD. Preliminary, December 2000.

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37. Richard B. Ertel and Jeffrey Reed, "Antenna Array Systems: Propagation and Performance," Ph.D. Dissertation, July 1999.

38. Nitin R. Mangalvedhe and Jeffrey Reed, “Development and Analysis of Adaptive Interference Rejection Techniques for Direct Sequence Code Division Multiple Access Systems,” Ph.D. Dissertation, July 1999.

39. Kim Phillips and Jeffrey Reed, “Probability Density Function Estimation for Minimum Bit Error Rate Equalization,” MPRG-TR-99-04, Masters Thesis, May 1999.

40. Zhong Hu and Jeffrey Reed, “Evaluation of Joint AOA and DOA Estimation Algorithms Using the Antenna Array Systems,” MPRG-TR-99-02, Masters Thesis, December 15, 1998.

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42. Nitin R. Mangalvedhe and Jeffrey Reed, "Development and Analysis of Adaptive Interference Rejection Techniques for Direct Sequence Code Division Multiple Access Systems," MPRG-TR-98-13, Ph.D. Preliminary, December 1998.

43. Pablo Maximiliano Robert and Jeffrey Reed, "Simulation Tool and Metric for Evaluating Wireless Digital Video Systems," MPRG-TR-98-11, Masters Thesis, September 23, 1998.

44. Steven F. Swanchara and Jeffrey Reed, “An FPGA-Based Multiuser Receiver Employing Parallel Interference Cancellation,” MPRG-TR-98-06, Masters Thesis, July 22, 1998.

45. Nishith Tripathi and Jeffrey Reed, “Generic Handoff Algorithms Using Fuzzy Logic and Neural Networks,” Ph.D. Dissertation, MPRG-TR-97-18, November 1997.

46. Don Breslin and Jeffrey Reed, “Adaptive Antenna Arrays Applied to Position Location,” MPRG-TR-97-14, Masters Thesis, August 1997.

47. Steve Nicoloso and Jeffrey Reed, “Investigation of Carrier Recovery Techniques for PSK Modulated Signals in CDMA and Multipath Mobile Environments,” MPRG-TR-97-11, Masters Thesis, May 1997.

48. Nishith Tripathi, Jeffrey Reed, and Hugh VanLandingham, “An Adaptive Direction Biased Fuzzy Handoff Algorithm with Unified Handoff Candidate Selection Criterion,” MPRG-TR-97-08, April 1997.

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50. Nishith Tripathi, Jeffrey Reed, and Hugh Van Landing ham, “A New Class of Fuzzy Logic Based Adaptive Handoff Algorithms for Enhanced Cellular System Performance,” MPRG-TR-97-06, April 1997.

51. Brian Fox and Jeffrey Reed, “Analysis and Dynamic Range Enhancement of the Analog-to-Digital Interface in Multimode Radio Receivers,” MPRG-TR-97-02, February 1997.

52. Alan Alexander, Shankari Panchapakesan, Don Breslin, Jeffrey Reed, Tim Pratt, and Brian Woerner, “The Feasibility of Performing TDOA Based Position Location on Existing Cellular Infrastructures,” MPRG-TR-96-37, December 20, 1996.

53. Nishith Tripathi and Jeffrey Reed, “Handoffs in Cellular Systems: A Tutorial,” MPRG-TR-96-35, November 1996.

54. Nena Zecevic and Jeffrey Reed, "Interference Rejection Techniques for the Mobile Unit Direct-Sequence CDMA Receiver," MPRG-TR-96-27, August 1996.

55. Kevin J. Saldanha and Jeffrey Reed, "Performance Evaluation of DECT in Different Radio Environments," MPRG -TR-96-28, August 5, 1996.

56. Rong He and Jeffrey H. Reed, "AMPS Co-Channel Interference Rejection Techniques and Their Impact on System Capacity," MPRG-TR-96-25, July 15, 1996.

57. Nevena Zecevic and Jeffrey H. Reed, "Techniques and Adaptation Algorithms for Direct Sequence Spread Spectrum Capacity," MPRG-TR-96-27, July 19, 1996.

58. Muhammad Khawar Khan, Jeffrey H. Reed, and Ivan Howitt, "Interference Mitigation in AMPS/NAMPS and GSM Using Artificial Neural Networks," MPRG-TR-96-24, June 1996.

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60. Tom Biedka and Jeffrey H. Reed, "Direction Finding Methods for CDMA Mobile Wireless Systems," MPRG-TR-96-20, June 1996.

61. Yash M. Vasavada and Jeffrey H. Reed, "Performance Evaluation of a Frequency Modulated Spread-Spectrum System," MPRG-TR-96-13, February 1996.

62. Milap V. Majmundar and Jeffrey H. Reed, "Adaptive Single-User Receivers for Direct Sequence CDMA Systems," MPRG-TR-96-12, January 1996.

63. Rong He and Jeffrey H. Reed, "Co-Channel Interference Rejection Techniques for AMPS Signals Using Spectral Correlation Characteristics," MPRG-TR-96-11, January 1996.

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66. Matthew Welborn and Jeffrey Reed, "Co-Channel Interference Rejection Using Model-based Demodulator" MPRG-TR-96-04, January 1996.

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69. Nitin Mangalvedhe and Jeffrey H. Reed, "An Eigenstructure Technique for Direct Sequence Spread Spectrum Synchronization," MPRG-TR-95-04, April 1995.

70. Y. M. Kim, N. R. Mangalvedhe, B. D. Woerner, and J. H. Reed, "Development of a Low Power High Data Rate Spread-Spectrum Modem," MPRG-PPR-95-01, February 10, 1995.

71. Y. M. Kim, N. R. Mangalvedhe, B. D. Woerner, and J. H. Reed, "Development of a Low Power High Data Rate Spread-Spectrum Modem," MPRG-PPR-95-02, June 30, 1995.

72. Paul Petrus and Jeffrey H. Reed, "Blind Adaptive Antenna Arrays for Mobile Communications," MPRG-TR-95-01, December 1994.

73. Steve Yao and Jeffrey H. Reed, "Differential Detection of GMSK Signals," MPRG-TR-94-27, October 1994.

74. Raymond Zheng, Jay Tsai, Rick Cameron, Lara Beisgen, Brian D. Woerner, and Jeffrey H. Reed, "Capacity and Interference Resistance of Spread-Spectrum Automatic Vehicle Monitoring Systems in the 902-928 MHz ISM Band," MPRG-TR-94-26, Final Report to Southwestern Bell Mobile Systems, October 14, 1994.

75. Fu-Sheng Cheng and Jeffrey H. Reed, "A New Approach to Dynamic Range Enhancement," MPRG-TR-94-25, October 16, 1994.

76. Raymond S. Zheng and Jeffrey H. Reed, "Channel Modeling and Interference Rejection for CDMA Automatic Vehicle Monitoring Systems," MPRG-TR-94-21, November 10, 1994.

77. Rong He and Jeffrey H. Reed, "AMPS Interference Rejection - Blind Time-Dependent Adaptive Filtering - Volume I," Final Report to ARGOSystems Inc., MPRG-TR-94-19, July 31, 1994.

78. Tahir H. Qazi and Jeffrey H. Reed, "Model-Based Demodulation of FM Signals - Volume II," MPRG-TR-94-17, Final Report to ARGOSystems, August, 1994.

79. Mala Subramanian and Jeffrey H. Reed, "Noncoherent Spread-Spectrum Communication Systems," MPRG-TR-94-14, August 10, 1994.

80. Frank Cheng, Anish Kelkar, Ira Jacobs, and J. H. Reed, "Performance Evaluation for the Dynamic Range Enhancement Technique (DRET)," MPRG-TR-94-10, Final Report to Southwestern Bell Technology Resources, September 7, 1994.

81. Volker Aue and Jeffrey H. Reed, "Optimum Linear Single User Detection in Direct-Sequence Spread-Spectrum Multiple Access Systems," MPRG-TR-94-03, March 1, 1994.

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Other Papers and Reports

1. P. Robert, Jeff Reed, "*Va. Tech Finds Soft Radio's Missing Link*," published in EE Times, August 16, 2004.

2. Jeffrey H. Reed, T.C. Hsia, and H. Etemad, "Differential Demodulation of BPSK Using Time Dependent Adaptive Filtering," Final Report to California MICRO Program, 1992.

3. Jeffrey H. Reed, "Adaptive Filters and Their Application To Interference Rejection," *Defense Electronics*, May 1989, pp. 85-86 and 89-90.

4. William Gardner, B.G. Agee, W. A. Brown, C. K. Chen, J. H. Reed, and R. S. Roberts, "A Comparison Of Fourier Transformation And Model Fitting Methods Of Spectral Analysis,"

Signal and Image Processing Lab Report No. SIPL-86-4, Department of Electrical and Computer Engineering, University of California, Davis, 1986. This work is included in *Statistical Spectral Analysis — A Non Probabilistic Theory* (Prentice-Hall).

Journal Papers in Review

1. R. Menon, A.B. MacKenzie, J. Hicks, R.M. Buehrer, J.H. Reed, "A Game-Theoretic Framework for Interference Avoidance," submitted to *IEEE Transactions on Communications*, April 2007.

2. Ruiliang Chen, Jung-Min Oark, Jeffrey H. Reed, "Defense against Primary User Emulation Attacks in Cognitive Radio Networks," submitted to *JSAC Special Issue on Cognitive Radio*, March 2007.

3. James O. Neel, Jeffrey H. Reed, Robert P. Gilles, and Allen B. MacKenzie, "A Low Complexity Dynamic Frequency Selection Algorithm for Cognitive Radio, submitted to *JSAC Special Issue on Cognitive Radio,*" March 2007.

4. Christopher R. Anderson, S. Venkatesh, J. Ibrahim, R.M. Buehrer, J.H. Reed, "Performance And Analysis of a Time-Interleaved ADC Array for a Software-Defined UWB Receiver," submitted to *IEEE Transactions on Circuits, Signals, and Systems*, March 29, 2007.

5. James O. Neal, Rekha Menon, Allen B. MacKenzie, Jeffrey H. Reed, Robert P. Gilles, "Interference Reducing Networks," submitted to *MONET Special Issue on Cognitive Radio Oriented Wireless Networks and Communications*, February 2007.

6. Ramesh Chembil Palat, A. Annamalai, Jeffrey H. Reed, "Efficient Bit Error Rate Analysis of Bandlimited Cooperative OSTBC Networks under Time Synchronization Errors", submitted to the *IET Communications*, January 2007.

7. R. Menon, R.M. Buehrer, J.H. Reed, "On the Impact of Dynamic Spectrum Sharing Technologies on Legacy Radio Systems, submitted to *IEEE Transactions on Wireless Communications*.

8. Jeffrey H. Reed, A.B. MacKenzie, and other faculty at Virginia Tech, "Cognitive Radio and Networking Research at Virginia Tech," submitted to *Special Issue for the IEEE Spectrum*, September 2006.

9. Ramesh Chimbil Palat, A. Annamalai, Jeffrey H. Reed, "Distributed MIMO for Cooperative Multi-Hop Wireless Mesh Networks," submitted April 2005 to *IEEE Wireless Communications Magazine Special Issue on Wireless Mesh Networking: Theories, Protocals, and Systems*.

10. Ramesh Chembil Palat, A. Annamalai, Jeffrey H. Reed, "Outage and Ergodic Capacities of Distributed STBC Cooperative Networks," submitted March 23, 2005 to *IEEE Transactions on Wireless Communications.*

11. R. Mostafa, M. Robert, J.H. Reed, "Performance Evaluation and Integration of a Reduced Complexity MIMO Technique for IEEE 802.11b," submitted to *IEEE Transactions on Wireless Communications*, February 2004.

12. M. Robert, L.A. DaSilva, J.H. Reed, "Reduction in Coexistent WLAN Interference Through Statistical Traffic Management," submitted to IEEE *Transactions on Vehicular Technology*, January, 2004

13. R. Mostafa, K. Dietze, R. Ertel, C. Dietrich, J. H. Reed, W. L. Stutzman, "Wideband Characterization of Wireless Channels for Smart Antenna Applications," submitted to *IEE Electronics Letters*, February 12, 2003.

14. R. Gozali, R. Mostafa, R.C. Palat, R. Nory, B.D. Woerner, J.H. Reed, *"On the Performance of Orthogonal STBC in Indoor and Outdoor MIMO Wireless Channels Using Analysis, Simulation and Measurement Campaign,"* submitted to *IEEE Journal on Selected Areas on Communications*, May 2002.

15. Byungki Kim, Warren L. Stutzman, Jeffrey H. Reed, Dennis G. Sweeney, *"A Comprehensive Investigation of Base Station Diversity Methods for Multipath Propagation Environments,"* submitted to *IEEE Transactions on Vehicular Technology*, Dec. 2001.

Conference Papers in Review

1. Jong Han Kim, Kyung K. Bae, Jeffrey H. Reed, "Capacity and Coverage of Reverse Link DS/CDMA Cellular Systems with MIMO Implementations." accepted to *ICC 2007*, Glascow, Scotland, June 24-26, 2007.

2. James O. Neel, Rekha Menon, Allen B. MacKenzie, Jeffrey H. Reed, "Interference Reducing Networks," accepted to *CrownCom 2007*, Orlando, FL, August 1-3, 2007.

3. R. Menon, A.B. MacKenzie, R.M. Buehrer, J.H. Reed, "Joint Power Control and Waveform Adaptation for Distributed Networks," submitted to *GlobeCom 2007*, Washington, DC. November 26-30, 2007. a

Selected Corporate Report Topics:

* Software Radios
* A DSP-Based Receiver for the New North American Digital Cellular Standard
* Spread Spectrum Detection Techniques
* Cyclic Spectral Analysis of Modulated Signals
* Projection of Future High-Volume Digital Communication Systems
* A High Speed Digital Filter for Sample Rate Conversion
* A Least-Squares System Identification Method
* Cyclic Adaptive Filtering for Interference Rejection
* Implementation Issues of Adaptive Interference Rejection Techniques
* Investigation of Modern Spectral Analysis Techniques
* The Performance of Time-Dependent Adaptive Filtering of Real Data
* A Maximum-Likelihood Estimator for Tracking and Detecting Frequency Hopping Signals
* Digital Signal Processing Algorithms for Squelch Control
* A Low-Cost Whitening Filter for Jammer Applications

* Time-Dependent Single Channel and Multi-Channel Interference Rejection Algorithms

Section V. Public Service/Outreach

Industrial Affiliate/
Outside Agency Contacts:

Keynote Speaker at the Communications Technology Program review, Planning and Assessment Meeting, "Distributed Computing for Collaborative Software Defined Radio," Naval Research Laboratory, May 1-3, 2007.

Advisory Board member for the IEEE International Conference on Ultrawideband, ICU 2005, Sept. 5-8, 2005, Zurich, Switzerland.

Moderator for the paper session, "Ultrawideband Design Approaches" at the Communications Design Conference in San Francisco, Ca., March 29-April 1, 2004.

Moderator for the panel, "UWB Panel on Communication Systems Design" at the Communications System Design Conference in San Diego, Ca., October 2003.

Chair of session titled, "Mobile Computing and Software Defined Radios," at the 2003 International Conference on Engineering of Reconfigurable Systems and Algorithms (ERSA 03), Las Vegas, NV, June 23-26, 2003.

Presentation titled "Software Radio: The Key for Enabling 4G Wireless Networks," at the International Forum on 4th Generation Mobile Communications at the Centre for Telecommunications Research, King's College London, London, United Kingdom, May 27-28, 2003.

Co-Technical program chairman for the SDR Forum conference, San Diego, CA Nov. 2002.

General Chair for the UWBST 2003 conference to be held in Reston, VA Nov. 16-19, 2003.

Technical program chairman for the SDR Forum/MPRG workshop on Smart Antenna, June 2003.

Strengthened relationship with CIT via collaboration with Jean Woods on venture capital funding mission

World International Disaster Risk Management Institute - collaborated with Bill Tranter, Arun Phadke, and Scott Midkiff on a position paper which led, in part, to the establishment of the new International Disaster Risk Management Institute, a partnership among the Swiss Federal Institutes of Technology, Virginia Tech, and the World Bank Disaster Management Facility to enable countries to use applied research

in wireless systems and critical infrastructure support to mitigate loss of life and property from disasters.

Invited to help DARPA define a new program in bio-mimesis, the imitation of living organisms through electronics and mechanics.

Assisted the Army Research Office in developing their five year research plan for communications.

Sponsorship:

Ahmed Darwish from Cairo University, June –Sept. 1999
Yeongjee Chung from Korea, January – August 1999.
Shinichi Miyamoto from Kobe, Japan, April 2001-March 2002
Young-Soo Kim from Seoul, Korea, February 2002-February 2003
Friedrich Jondral from Karlsruhe, Germany, April – June 2004
Francisco Portelinha from Brazil, October 2004-February 2006
Seuck Ho Won from Korea, February 2005-January 2006
Duk Kyu Park from Seoul South Korea, January 1, 2007-February 28, 2008

External Professional Service:

Committee assignments, councils or commissions, journal editor, reviewer:
IEEE Transactions on Signal Processing
IEEE Transactions on Antennas and Propagation
IEEE Transactions on Wireless Communications
IEEE Transactions on Communications
IEEE Transactions on Aerospace and Electronics Systems
IEEE Transactions on Selected Areas of Communications
IEEE Signal Processing Letters
IEEE Communications Magazine
IEEE Communications Letters
Army Research Office Strategic Plan
NSF Proposal Reviewer
Workshop on Biomimic (sponsored by DARPA to define a new program)
Member, Advisory board for TechContinuum
Member of Samsung Technical Advisory Board
Reviewer for the International Journal of Electronics May 2003
Faculty Advisory Committee, Information Technology, 2003
IEEE International Conference Advisory Board member, 2005

State/University Professional Service:

Committee/Task Force assignments:
Participation within the Center for Wireless Telecommunications(CWT)
Department Computing Committee
Faculty Advisor to the Honor System
EE Graduate Administrative Committee (Grad AdCom)
Communications Area Committee
US Student Recruitment Strategy Task Force

Course supervisor of ECPE 5674 and ECPE 4654
ECE Department Head Search Committee 2003
ECE Executive Committee
ECE Resource Committee
Deputy Director, MPRG
ECE Recruiting Committee

Section VI. Industrial Experience

Industrial Experience:

March 2000 - 2001

Co-founded Dot Mobile, Inc.
Company specializes in mobile data applications including wireless-internet based applications.

March 1986 – present

Founded Reed Engineering
Company performs consulting in wireless communications and signal processing.

Selected past project:

- Samsung Technical Advisory Board (Future Forum)
- Software Architecture for Radios
- Expert witness in wireless location systems
- Evaluation of a wireless high-speed internet access system
- Evaluation of wireless/signal processing companies for acquisition
- Tutorials on software radio issues
- Adaptive interference rejection techniques
- Spread spectrum signal detection
- Expert witness for wireless power sources

August 1980

Member, Technical Staff Signal Science, Inc., Santa Clara, CA

Areas of specialization:

- Spread spectrum detection
- Foreign technology analysis
- Computer systems administration