Bruce McNair

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Holmdel, NJ 07733
bmcnair@novidesic.com
1-732-371-5026

Career Summary

- Sixty years engineering research, design, development, systems engineering experience in communications systems (including extensive background in wireless communications and system/network security)
- Twenty four years as a well-rated member of one of world's most highly respected R&D organizations, recognized for breadth, depth and practicality of expertise
- Extensive experience teaching technical short courses for premiere educational programs over a fourteen year period
- Full time university educator for fifteen years with experience teaching a broad set of courses focusing on practical engineering approach
- On-line university educator for twenty years teaching well-attended graduate courses in wireless and security technologies

Research interests

- High speed wireless data networking
- System/network security
- Geolocation technology
- Real-time digital signal processing
- Software-Defined Radio technology
- Broadband Powerline (BPL) technology

Present Organizations

- Stevens Institute of Technology,
- Novidesic Communications, LLC

Job Titles

- Distinguished Service Professor of Electrical and Computer Engineering
- Founder, Chief Technology Officer

Education

- M.E., E.E., Stevens Institute of Technology, 1974
- B.E. (with Honor), Stevens Institute of Technology, 1971
- Completed qualifiers and course work for PhD in Computer Science at Stevens

Juniper Exhibit 1004
Juniper v. Portsmouth

Relevant Experience

January 2003 – present – on-line teaching professor – Electrical and Computer Engineering, Stevens Institute of Technology, Hoboken, NJ;
Teach several well-enrolled on-line graduate courses in wireless security, information systems security and physical design of wireless communications systems.

August 2002 – December 2017 (retired) – Distinguished Service Professor of Electrical and Computer Engineering, Program Director, Computer Engineering graduate program, Stevens Institute of Technology, Hoboken, NJ;
Design and manage the Senior Design Project, a two-semester program that forms a substantial portion of the senior year in the engineering program. This project comprises a large fraction of the seniors' efforts and serves to provide real-world engineering design experiences for the student. Teach a large number of well-enrolled graduate and undergraduate core and elective courses. Conduct research in wireless systems, geolocation services, and broadband powerline (BPL) systems, particularly security needs and solutions. Member of Stevens Intellectual Property Review Board, Stevens Honor Board Advisory Council, Stevens' Schaeffer School of Engineering and Science Promotion and Tenure Committee, and the Senior Design Coordinator Committee.

February 2002 – present – CTO, Novidesic Communications, LLC, Holmdel, NJ;
Founded a technical consulting company, providing expert witness support and testimony, telecommunications, wireless networking, security, software, computing, product evaluation, proof-of-concept prototyping, and web site design guidance to individuals and small businesses. Clients include health care facilities, patent attorneys, major telecommunications providers, venture capitalists, major component manufacturing company, start-up hardware and concept development companies. Supported technology needs of small local business leading to Phase I and Phase II SBIR funding in the area of RFID with patented technology. Provide IP portfolio evaluation. Expert witness in patent litigation with experience testifying at deposition and trial as well as preparing USPTO IPR declarations.

August 2011 – February 2012 – Part-time consultant, Lockheed-Martin, Moorestown, NJ;
Support development of advanced radar systems and interactions with other wireless systems.

2010 – 2015 (part-time, on an as-needed basis) – Senior Systems Engineer consultant, AT&T Government Solutions, Columbia, MD;
Support AT&T's projects with the US Government customers on defense and intelligence-related systems, drawing on previous knowledge and experience in signal processing, wireless systems, telephone and computer networks, and secure system design.

Relevant Experience (continued)

May 1994 to February 2002 (retired) -- Wireless Systems Research Department, AT&T Bell Labs/ AT&T Labs - Research, Holmdel/Red Bank/Middletown, NJ
Member of Technical Staff/Research Staff Member/Principal Technical Staff Member/Technology Consultant; Investigating high-speed, high-mobility wireless data communications systems for untethered access to high speed global networks. Proposed and investigated IEEE 802.11(a & b) physical and MAC layer extensions to outdoor, high mobility environment. Efforts involved system architecture, system control, real-time DSP programming in C, high-speed hardware design, RF design, analog, RF interfacing, Matlab/SIMULINK simulation and experimental investigations. Responsible for complete design, implementation and characterization of a multiple TMS320C40-based 384 kb/s OFDM transmission system and definition/design of advanced signal processing platforms. Recent research extended results to 5-40 Mb/s with TMS320C62/FPGA-based platform and incorporated 802.11a and DVB-T technology. Previous research involved speech quality/data rate enhancements to IS-136, the North American TDMA cellular standard.

November 1987 to April 1994 -- Security and System Reliability Architecture Group, AT&T Bell Labs, Holmdel, NJ
Technical Manager; Created, staffed, and led a group of security, systems reliability and fraud control experts to assess security/quality of products, services, operations systems, communications networks, operating systems, and work centers and to recommend, specify, and prototype cost effective improvements. Created corporate process to build security into the development process. Transformed small (2 person) corporate-funded activity into well-staffed (multi million dollar), successful business unit supported program. Served as security technologies subject matter expert for AT&T Corporate Security and other (AT&T and outside) organizations

May 1982 to October 1987 -- various AT&T Bell Labs organizations, MTS - Supervisor; System Design, Exploratory Development, Applied Research, and Final Product Development of secure voice terminals, modems, speech recognition and speaker verification systems, security chips, encryption devices, and network management systems

June 1978 to April 1982 -- various AT&T Bell Labs organizations, Member of Technical Staff, System design, digital hardware design and simulation of wide area (X.25) data communications networks and high-speed data transmission techniques for voiceband modems. Led $1M IR&D secure voice terminal initiative, ultimately resulting in promotion to MTS-Supervisor and laying groundwork for AT&T's breakthrough success in NSA’s STU-3 program.

Relevant Experience (continued)

June 1971 to February 1973, January 1974 to June 1978 -- U.S Army Communications R&D Command, Fort Monmouth, NJ. GS-7, 9, 11 & 12 Electronic Engineer (GS-0855)
Development of tactical military radio communications equipment, specializing in modulation, data transmission, communications security and electronic warfare (frequency hopping and direct sequence spread spectrum) for the SINCGARS VHF-FM radio system.

March 1973 to December 1973 -- ITT Defense Communications Division, Nutley, NJ.
Junior Member of Technical Staff; Designed, developed and tested software and digital hardware for portable satellite terminals for use by White House and the world's first hardware implementation of a 2400 bps Linear Predictive Coder (LPC) secure speech transmission system.

Patents, Presentations and Publications

Twenty six U.S. patents and nineteen international patents granted (several pending) in areas such as data transmission, cryptographic techniques, speech processing, video processing, security systems, user authentication, fraud control, synchronization, dynamic channel assignment, localization techniques, hazardous voltage detection, RFID, biomedical applications, vibration energy harvesting, solar energy harvesting for portable devices, etc.

Presented numerous well-rated short courses in Digital Communications, Digital Telephony, Digital Signal Processing, and Wireless Communications, & Security. Course sponsors included: Bell Labs In-hours Continuing Education Program, George Washington University, University of Maryland, UCLA Extension, Johns Hopkins University – Organizational Effectiveness Institute, Berlin (Germany) Continuing Engineering Education Program, Monmouth University, and the Fort Monmouth Education Center.

Several papers presented at IEEE Vehicular Technology and other Conferences and published in AT&T Technical Journal, IEEE Transactions on Wireless Communications, and IEEE Communications Magazine on various topics in wireless systems and security.

Skills

System/network architecture, communications system design, digital hardware design, RF design, signal processing, real-time DSP programming, software design and coding, proof-of-concept prototyping, designing and conducting laboratory research experiments, OFDM, TDMA/IS-136, FPGA, encryption, computer network security, threat assessment, data communications protocols, computer architecture, digital and analog video systems, system & link-level simulation, UNIX/Linux, Windows, C/C++, Matlab/Simulink, MathCad, PASCAL, Algol, SNOBOL, Verilog, VHDL, FORTRAN. Recruitment, development and management of highly effective technical staff. Highly effective technical presentations and training sessions to any level audience. Well-developed technical writing skills. Preparation, deposition, and testifying regarding expert report for patent infringement/non-infringement/validity/invalidity and other litigation matters. Assist in claim construction and prior art research for patent litigation.

Other information

U.S Citizen. Held Top Secret - Sensitive Compartmented Information (TS/SCI) clearance with full scope polygraph until October 2015.

Selected as one of twenty-six finalists among 490 entrants in the 2014 Bell Labs Prize competition for proposal "High-precision, low-cost, low-power indoor geolocation techniques."

Stevens Institute of Technology, Henry Morton Distinguished Teaching Professor, 2013-2014.

Named to New Jersey Inventors Hall of Fame, Inventor of the Year (2012) for "Patented/Innovative Research and Entrepreneurial Leadership Related to: Groundbreaking modem development and next generation wireless data communications systems"

Mentored two AT&T Labs Fellowship Program (ALFP) participants, three students in the MentorNet program, 5 Bell Labs Early Career Advisory Program (ECAP) participants, numerous summer students (graduate and undergraduate), several new employees, and all of the staff in groups I have managed.

Advised a significant fraction of ECE Senior Design groups, numerous graduate students; participation in thesis committees of several Stevens PhD students in various departments, including Physics, Computer Science, Mechanical Engineering, and ECE. Consult with non-ECE students on ECE aspects of their Senior Design projects

Mentor summer students at Stevens in NSF-funded Research Experience for Undergraduates (co-PI).

Stevens Institute of Technology, Schaefer School of Engineering, Undergraduate Teaching Award, December 2006.

Life Senior Member, Institute of Electrical and Electronic Engineers - Member of Communications, Signal Processing, Computer and Education Societies

Member, American Society for Engineering Education

Secretary, IEEE Communications Society Communications Security Committee

Identified by Rutberg & Co. Investment Bankers (San Francisco) as member of a group of 213 "Top Wireless Influencers: 2002"

Member of the Council of Communications Advisors

Amateur radio operator licensed since 1963, Amateur Extra Class since 1970

Contact Information

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http://www.novidesic.com

US Patents

- “Liquid Crystal Display using the photovoltaic behavior of LED backlights as a source of electrical energy.” US Patent #10,310,326, June 4, 2019.
- “Method and apparatus for locating and distinguishing blood vessel.” US Patent #8,764,663, July 1, 2014.
- “Secure IP access protocol framework and supporting network architecture,” US Patent #8,046,577, October 25, 2011.
- “Method for Estimating Time and Frequency Offset in OFDM Systems,” US Patent #7,990,839, August 2, 2011.
- “Simulcasting OFDM system having mobile station location identification,” US Patent 7,962,162, June 14, 2011.
- “RFID Devices for Verification of Correctness, Reliability, Functionality and Security,” US Patent 7,712,674, May 11, 2010.
- ““Dynamic Channel Assignment,” US Patent 7,457,259, November 25, 2008.
- ““RFIDs Embedded into Semiconductors,” US Patent 7,348,887, March 25, 2008.
- “Method for Estimating Time and Frequency Offset in OFDM Systems,” US Patent #7,310,302, December 18, 2007.
- “Mobile Device Having Network Interface Selection,” US Patent #7,180,876, February 20, 2007.
- "Dynamic Channel Assignment," US Patent #6,954,465, October 11, 2005.
- “Method for Estimating Time and Frequency Offset in OFDM Systems,” US Patent #6,891,792, May 10, 2005.
- "Security System Providing Lockout for Invalid Access Attempts," US Patent #5,559,505, September 24, 1996.
- "Telecommunications Fraud Detection Scheme," US Patent #5,504,810, April 2, 1996.
- "Authenticator Card and System," US Patent #5,450,491, September 12, 1995.
- "Secure Telecommunications," US Patent #5,392,357, February 21, 1995.
- "Data Message Storage and Pickup Service,” US Patent #5,392,336, February 21, 1995.
- "System and Method for Granting Access to a Resource," US Patent #5,375,244, December 20, 1994.
- "Secure Teleconferencing," US Patent #5,353,351, October 4, 1994.
- "Method and Apparatus for Processor Based Encryption," US Patent #5,278,905, January 11, 1994.
- "Centralized Security Control System," US Patent # 5,276,444, January 4, 1994.
- "Technique for Voice Based Security System," US Patent #5,265,191, November 23, 1993.

US Patents (continued)

- "Video Scrambling System", US Patent # 5,206,906, April 27, 1993.
- "Cryptographic Transmission System," US Patent #4,642,424, February 10, 1987.
- "Processing of Encrypted Voice Signals," US Patent #4,608,455, August 26, 1986.
- "Control of Coefficient Drift for Fractionally Spaced Equalizers," US Patent #4,376,308, March 8, 1983

Several other published and unpublished US patents pending

International Patents

- “Voltage-controlled apparatus for battery-powered electronic devices,” EP Patent #0568237 B1, January 23, 2002.
- “A Dynamic Channel Assignment,” EP Patent #1,137,299, September 26, 2001.
- “Data Message Storage and Pickup Service,” EP Patent #0626776 B1, April 7, 1999.
- “Data Message Storage and Pickup,” Canadian Patent #CA-2119227A1, February 24, 1998.
- “Centralized Security Control System,” Canadian Patent #CA-2078077, January 27, 1998.
- “Improved centralized security control system and method,” EP Patent #0534679. August 12, 1997.
- “Authenticator Card with Changing Bar Code Pattern,” EP Patent #0,715,789, June 12, 1996.
- “Technique for voice-based security systems,” Canadian Patent #CA-2072172, April 30, 1996.
- “Method and apparatus for user identification and verification of data packets in a wireless communications network,” EP Patent #0,689,316, December 27, 1995.
- “Central Difference Control System,” Japanese Patent #1995-131526, May 19, 1995.
- “Authenticator Card with Changing Bar Code Pattern,” WO Patent #1995/006371, March 2, 1995.
- “Method for safety system of voice base and device therefore,” Japanese Patent #1995-049696, February 21, 1995.
- “Data message storage and pick up service, EP Patent #0,626,776, November 30, 1994.
- “Method for safety system of voice base and device therefore,” Japanese Patent #1995-049696, February 21, 1995.
- “Data message storage and pick up service, EP Patent #0,626,776, November 30, 1994.
- “Apparatus for battery type electronic device,” Japanese Patent #1994-138983, May 20, 1994.
- “Method and system for making communication via exchange network available, method for providing,” Japanese Patent #1994-085811, March 25, 1994.

International Patent (continued)

- Voltage-controlled apparatus for battery-powered electronic devices," EP Patent #0,568,237, November 3, 1993
- "Security node in switched telecommunication network", EP Patent #0,553,553, August 4,1993.
- "Improved centralized security control system and method," EP Patent 0,534,679, March 31, 1993.
- "An improved technique for voice-based security systems," EP Patent #0,533,396, March 24, 1993.
- "Cryptographic Transmission System," Canadian Patent #CA-1223932, July 7, 1987.

Several other published and non-published applications pending.

Journal Publications

- Leung,K., Clark,M.V., McNair,B., Kostic,Z., Cimini,L.J., Winters,J.H., "Outdoor IEEE 802.11 Cellular Networks: Radio and MAC Design and Their Performance", *IEEE Transactions on Vehicular Technology*, Vol. 56, No. 5, pp. 2673-2684, September 2007.
- Chuang, J., Cimini, L., Li, G., Lin, L., McNair, B., Sollenberger, N., Suzuki, M., Zhao, H., "High Speed wireless data access based on combining EDGE with wideband OFDM," *IEEE Communication Magazine*, November, 1999.
- D'Angelo, D.M., McNair, B., Wilkes, J.E., "Security in Electronic Messaging Systems," *AT&T Technical Journal*, Volume 73, Number 3, 1994.

Research awards

- "Standalone/Networked Compact, Low Power, Image-fused Multi-Spectrum Sensor System for Target Acquisition, Tracking and Fire Control," ARDEC, $2365000, co-PI with Victor Lawrence, Hong Man. AY2008-2009
- NSF: "REU Site: Integrated Software Radio and Radio Frequency Test Bed for Wireless Research in Dynamic Spectrum Access"; $296,754; NSF; Co-PI with Yu-Dong Yao. AY2004-2005
- AT&T Labs-Research Equipment donation of $900k DSP systems and wireless test equipment. AY2003-2004
- AT&T Labs-Research - $60k grant for "Investigation of Broadband Powerline technology" AY2003-2004

Masters theses supervised

- Xiongwei Xu, "The synchronization of IEEE 802.11A System", May 2014.
- Abdurazak Fathalla, "Security of Cloud Computing," May 2011.
- Tejas Marathe, "Comprehensive Performance Criteria for Wi-Fi Location Systems," December 2008.

Masters theses supervised (continued)

- Milin Patel, “Network Performance Enhancement using QoS, TCP Optimization, Application Acceleration and Dynamic Resource Allocation Techniques,” January 2008.
- Leo Gerard Raj, “Security in 4G Wireless Systems,” May 2005.

PhD committees

- Chao Tian, “Realization of Pure AM/FM Modulation via Combined Optical and Electrical Injection of Carriers in DFB Laser,” Stevens Institute of Technology, Physics Department, March 2015.
- Tao Yang, “All-optical frequency modulation of quantum cascade laser and its application on infrared spectroscopy,” Stevens Institute of Technology, Physics Department, May 2014.
- Fangming He, “Physical Security in Wireless Communications,” Stevens Institute of Technology, Electrical and Computer Engineering Department, May, 2012.
- Vinod Challa, “Vibration Energy Harvesting for Low Power and Wireless Applications,” Stevens Institute of Technology, Mechanical Engineering Department, May, 2011.
- Brian Borowski, “Application of Channel Estimation to Underwater Acoustic Communication,” Stevens Institute of Technology, Computer Science Department, June, 2010.
- Gang Chen, "All-Optical Modulation of Quantum Structure/Devices," Stevens Institute of Technology, Physics Department, May 2010.

Conference Papers

- He, F., Man, H., Kivanc, D., McNair, B., “EPSON: Enhanced Physical Security in OFDM Networks,” Proc. ICC 2009, Dresden, Germany, June 2009.
- Patel, S.; Cimini Jr, L.J.; McNair, B., “Comparison of frequency offset estimation techniques for burst OFDM,” *Proc. IEEE Vehicular Technology Conference VTC2002*, Birmingham, AL, May, 2002.
- Cimini, L., Leung, K., McNair, B., Winters, J. "Outdoor IEEE 802.11b Cellular Networks: MAC Protocol Design and Performance," *Proc. ICC 2002*, New York, NY, April 2002
- Clark, M., Leung, K., McNair, B., Kostic, Z., "Outdoor IEEE 802.11b Cellular Networks: Radio Link Performance", *Proc. ICC 2002*, New York, NY, April 2002.
- McNair, B., “Software Radio – the Commercial Perspective,” *Proc. IEEE Sarnoff Symposium*, Princeton, NJ, March 2002.
- Zou, H., Daneshard, B., McNair, B., "An Integrated OFDM Receiver for High-Speed Mobile Data Communications," *Proc. IEEE Globecom 2001*, San Antonio, TX, Oct. 2001.
- McNair, B., "Future Directions for Wireless Communications," *Supercomm2001*, Atlanta, GA, June, 2001

Conference Papers (continued)

- Cimini, L., McNair, B, "OFDM for High Data Rate, High-Mobility, Wide-Area Wireless Communications," *Proc. IEEE Sarnoff Symposium*, Princeton, NJ, March, 2001.
- Cimini, L., McNair, B, Sollenberger, N., "Implementation of an Experimental 384 kb/s Radio Link for High-Speed Internet Access," *Proc. IEEE Vehicular Technology Conference VTC2000*, Boston, MA, September, 2000.
- Cimini, L., McNair, B, Sollenberger, N., "Performance of an Experimental 384 kb/s 1900 MHz Radio Link In a Wide-Area High-Mobility Environment," *Proc. IEEE Vehicular Technology Conference VTC2000*, Boston, MA, September, 2000.
- Takamura, K.; Kunihiro, T.; Yamaura, T.; Fujita, E.; Anderson, G.; Chibane, C.; Feinberg, P.; Sollenberger, N.; McNair, B.; Mielcarek, E., "Field trial results of a band hopping OFDM system,' *Proc. IEEE Vehicular Technology Conference VTC99-Fall*, 1999. Amsterdam, the Netherlands, September 1999.
- McNair, B., Cimini, L., Sollenberger, N., "A Robust Timing and Frequency Offset Estimation Scheme for Orthogonal Frequency Division Multiplexing (OFDM) Systems," *Proc. IEEE Vehicular Technology Conference, VTC99*, Houston, TX, May 1999.
- McNair, B., Gupta, S., Kostic, Z., Sollenberger, N., "Experimental Results for Extensions to the IS-136 TDM Standard Based on Higher Level Modulation, Coherent Detection, and Equal Gain Antenna Combining," *Proc. IEEE Vehicular Technology Conference, VTC99*, Houston, TX, May 1999.
- Kostic, Z., McNair, B., Sollenberger N., "Experimental Performance Results of an Indoor Wireless Extension of IS-136 Based on pi/8 D8PSK, Coded Modulation, and Antenna Diversity," *Proc. IEEE Vehicular Technology Conference, VTC98*, Ottawa, Canada, May 1998.
- McNair, B., "The Effectiveness of Preselection Diversity for Indoor Wireless Systems," Proc. Int. Conf. on Universal Personal Communications, San Diego, CA, Oct. 1997.

Invited talks

- "Adventures in On-Line Education," Tsinghua University Webinar: Showcasing Online Course Designs, Online Teaching Guidance Expert Group, International Center for Engineering Educations (ICEE) – The United Nations Educational, Scientific and Cultural Organization (UNESCO), April 27, 2020.
- "Providing Structure, Motivation and Process in Security Education," Stevens/NIKSUN Workshop on Innovations in Cyber Security Research, Education and Training, Hoboken, NJ, March 2015
- "Wireless Security Panel," IEEE/AFCEA Fort Monmouth Annual Information Technology Forum and Expo, April 2005.

Invited talks (continued)

- "Of What Use is Wireless Multimedia Without Security," "What's Next in Multimedia Panel," 14th Annual Wireless and Optical Communications Conference, April 2005.
- "Is Wireless Security an Oxymoron?" IEEE Princeton/Central NJ Communications and Consumer Electronics and Computer Science Chapters, December, 2003.

Other Publications

- McNair, B., "Automatic Repeater Offsets," *73 Magazine,* November 1978, pp. 82-86.
- McNair, B, Williman, G., "Digital Keyboard Entry System," *Ham Radio,* Volume 11, Number 9, September, 1978, pp. 92-97.
- McNair, B., "A Digital Display for Amateur Radio Communications Equipment," *Ham Radio,* Volume 9, Number 9, September 1976, pp. 16-25.
- MIL-STD-188-114, "Electrical Characteristics of Digital Interface Circuits," Department of Defense Interface Standard, 24 March 1976

- Graduate:
  - EE/CpE-517 - Digital and Computer Systems Architecture (on-campus)
  - EE/TM/NIS-584 – Wireless System Security (on-campus and on-line)
  - EE-585/PEP-685/MT-685 – Physical Design of Wireless Communications (on-campus and on-line)
  - NiS/CpE-691 – Information Systems Security (on-campus and on-line)
  - EE/CpE-810A - Special Topics in EE/CpE - Digital and Computer Systems Architecture (on-campus)

- Undergraduate (on-campus):
  - E-232 – Design IV
  - BME-322 – Biomedical Design VI
  - EE/CpE-322 – ECE Design VI
  - EE/CpE-345 – Modeling and Simulation
  - CpE-358/CS-381 –Switching Theory and Logical Design
  - EE-359 – Electronic Circuits
  - EE/CpE-423; EE/CpE-424 – Senior Design
  - CpE-450 – Real-time Embedded Systems

Short Courses

- “Electronics and Computers,” preparation course for Fundamentals of Engineering/Professional Engineering license
  Stevens Institute of Technology
- "Digital Signal Processing - Principles, Architecture, and System Applications"
  - *Organizational Effectiveness Institute (originally Johns Hopkins University's continuing education program)*,
- "Wireless Digital Communications Systems: Components, Specifications, Test and Evaluation"
  - *Organizational Effectiveness Institute*
- "Security in Digital Communications Networks"
  - *Bell Labs Architecture Area Adopt a University Program: Grambling State University*
  - *Monmouth University*
- “Digital Telephony"
  - *Monmouth University*
  - *Fort Monmouth Education Center*
  - *Berlin (F.R.G.) Continuing Engineering Education Program*
- "Digital Communications & Applications"
  - *University of Maryland*
  - *Fort Monmouth Education Center*
  - *UCLA Extension University*
- "Digital Communications," presented with Allen Gersho, N.S. Jayant and David Falconer.
  - *George Washington University*
- "Data Communications for the System Designer"
  - *Bell Labs In-Hours Continuing Education Program*

Expert witness, patent consulting experience

- Authentication technology
- Bluetooth, WiFi, ZigBee, and other local/personal area wireless networking
- Cellular systems
- Communications networking
- Digital clock control for power management in SoCs
- Digital Rights Management
- Digital Subscriber Loop (DSL) technology
- Electronic technology
- Embedded systems
- Emergency alerting systems
- Geolocation technology
- Industrial process control software
- Localization services
- Messaging systems
- Multifactor Authentication
- Peer-to-peer and client-server networks
- Secure voice communications
- Signal processing
- Smart cards and magnetic stripe cards for payment systems
- Software/firmware code analysis (C, VHDL)
- Software trade secrets
- Television and television tuner technology
- Trusted systems
- User and system authentication technology
- Video messaging
- Video scrambling and pay-per-view systems
- Voice processing and voice response systems
- Wireless communications and networking – particularly PHY and MAC layers

Law firms supported

- Alston-Bird, New York, NY and Charlotte, NC (Ross Barton, Kirk Bradley, Darlena Subashi, Karlee Wroblewski)
- Baker & McKenzie, Dallas, TX (William McSpadden)
- Bradley, Birmingham, AL (Paul Sykes, Benn Wilson, Jake Gipson)
- Bragalone-Conroy, Dallas, TX (Nick Kliewer, Daniel Olejko, Stephanie Wood)
- Cantor-Colburn, Hartford, CT (Steve Coyle)
- Carella-Byrne (Donald Ecklund)
- Clark-Hill, Pittsburgh, PA, (J. Alexander Hershey)
- Desmarias, New York, NY (Kerri-Ann Leembeck)
- DLA Piper, Austin, TX, San Francisco, CA and San Diego, CA (Brian Erickson, Gerald Sekimura, Kevin Hamilton)
- Fox Rothschild, Lawrenceville, NJ (Gerard Norton)
- Gibbons-Deldeo, Newark, NJ (Michael Cukor, Sheila McShane, Vin McGeary, Erich Falke, Chris Strate)
- Goodwin-Proctor, New York, NY and Washington, DC. (Mark Abate, Calvin Wingfield)
- Greenberg-Traurig, McLean, VA (Andrew Sommer)
- Hogan-Lovells, Denver, CO (Matt Rozier, Aaron Oakley, Lucky Vidmar)
- Jones-Day, New York, NY (Tom Gianetti)
- Latimer, LLP, Oakhurst, NJ (Brian Latimer)
- Merchant-Gould, Atlanta, GA (George Jenson)
- Morrison-Foerster, San Diego, CA (Christian Andreau-von Eaw)
- Oblon Spivak, Arlington, VA (Robert Mattson, Scott McKeown)
- Orrick, Herrington and Sutcliffe, Silicon Valley (Jason Angell)
- Quattlebaum, Grooms, Tull & Burrow, Little Rock, AR (Steve Quattlebaum)
- Quinn-Emanuel, New York, NY (Marc Kaplan)
- Ropes & Gray, Washington, DC, (Scott McKeown, Victor Cheung)
- Sabety & Associates (Ted Sabety)
- Sidley Austin, Chicago, IL, Washington, D.C. (Doug Lewis, Rick Cederoth, Mike Franzinger)
- Steptoe & Johnson, Washington, D.C. (Kate Cappaert, Brian Johnson)
- Carr & Waddoups, Salt Lake City, UT (Trent Waddoups)
- Unified Patents, Washington, DC (Michelle Callaghan/Aspen, Ashraf Fawzy, Jung Hahm, Roshan Mansinghani, Jessica Marks, Jordan Rossen, David Seastrunck)
- Wilson, Sonsini, Goodrich & Rosati, Palo Alto, CA, Seattle, WA (Matthew Argenti, Quincy Lu)
- White Case, Washington, DC, New York, NY (David Tennant, Grace Wang)
- Wisser and Weinstein, West Hartford, CT (Kerry Wisser)
- Woodcock and Washburn, Philadelphia, PA (Michael Bonella)