A. Brinton Cooper III[1]

Department of Electrical and Computer Engineering
The Johns Hopkins University
Baltimore, MD 21218
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Education

PhD (Electrical Engineering), The Johns Hopkins University
Dissertation: *Iterated Codes with Improved Performance*

MSEE, Drexel Institute of Technology
Thesis: *Stability of a Phase Locked Loop with a Frequency Ramp Input*

BES (Electrical Engineering), The Johns Hopkins University

Academic Appointments

Associate Research Professor   September, 2001, to present
Department of Electrical and Computer Engineering,
The Johns Hopkins University.

CURRENT: Building a research and education program in communications, focusing on fiber optic and wireless paradigms, by (1) funded collaborative research in multiple access fiber optic techniques; (2) funded research on channel coding techniques for disadvantaged UHF channels; (3) building a small experimental facility to support US Army-sponsored research in wireless multiple input/multiple output (MIMO) communications. PREVIOUS: (1) exploration of applications of wireless technology to surgical problems; (2) analysis of execution time performance of decoders.

Adjunct Professor   1998-2001
Department of Electrical and Computer Engineering,
Morgan State University.

Initiated a collaborative research program among Morgan's (then) newly created graduate ECE program, the ECE Department at the University of Delaware, and the US Army Research Laboratory; introduced and guided new courses through the university's approval process; jointly supervised doctoral student research and dissertation preparation on improved diversity combining schemes for fast frequency hopping in ad-hoc, multiple access, wireless networks.

Adjunct Professor   1996-2001
Department of Electrical and Computer Engineering,
University of Delaware.

Participated in the first academia/government collaboration under the Federated Laboratory Program of the US Army Research Laboratory; introduced and taught new communications courses in ECE; served as PhD dissertation reader and committee member; supervised undergraduate project; collaborated on robust receivers for impulsive channels; established joint research projects with Morgan State University and the Army Research Laboratory.

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Fellow-by-Courtesy 1989-2001
Department of Electrical and Computer Engineering,
The Johns Hopkins University

Collaborated with Prof. Brian Hughes on multiuser codes that achieve near channel capacity; investigated topics on wireless networks, and diversity communications; sponsored PhD student research; served as guest member on several PhD committees.

Instructor 1980-1984, 1989-1995
Department of Computer and Information Sciences,
University of Delaware.

Taught computer hardware and software architecture courses to upper division Computer Science undergraduates.

Non-academic Positions

Employment

Senior Research Engineer 1983-2001
US Army Research Laboratory,
Aberdeen Proving Ground, MD

Devised fast (one-step) decoding algorithm for BCH-like algebraic codes; mentored or collaborated with visiting senior faculty and postdoctoral fellows including: Prof. Donald Mills (on long sequences based on polynomials, the roots of which are composed sums), Dr. Charles T. Retter (on properties and decoding of binary expansions of Reed-Solomon Codes), Prof. Dimitri Kazakos (on list decoding for channels with unknown or partially known statistics); collaborated with university partners in research on communications over impulsive interference channels; designed wireless communications and networking research programs for the Laboratory; established and participated in collaborative research programs with university partners; served on research proposal panels for the US Army Research Office.

Electronics Engineer 1968-1983
US Army Materiel Systems Analysis Activity
Aberdeen Proving Ground, MD

Evaluated performance of developmental communications systems for battlefield use; analyzed susceptibility to jamming of satellite and terrestrial links; determined large scale test data requirements to validate such analyses.

Electronics Engineer 1961-1968
Various industrial positions
Baltimore, MD

Research into correlation properties of filtered (analog) pseudorandom sequences for spread spectrum satellite communications; designed UHF resonant cavity coupling device for phased array radar; designed digital subsystems for radar system testing, air traffic controller training, and anti-submarine warfare.

Consulting

Engenium Technologies Corporation, Columbia, MD: on error control codes for disadvantaged UHF channels.

Advanced Technology Mechanization Company, Bethesda, MD: channel coding systems research and development

(2001-2008).

Scadden, Arps, Slate, Meagher & Flom LLP, Washington, DC: on intellectual property issues relating to multiple access communications (2005).

University of Maryland Baltimore County, *Reed-Solomon Codes for the Binary Asymmetric Channel,* for Prof. J. Morris, 2003.

Maryland Shock Trauma Institute, Baltimore, MD: collaboratively designed original Emergency Medical Communication System (EMS) for the Baltimore metropolitan area (1975-6).

Thinksharp, Inc, Bel Air, MD: innovations in mathematics education and enrichment (1998).

Research Interests

fiber optic communications, mobile wireless communications, multiple access communications, channel coding and decoding and their applications.

Teaching and Research

Doctoral Students

Brian Grubel, First Year PhD student, Department of Electrical and Computer Engineering,
The Johns Hopkins University, 2013-

John Franklin, PhD student/RA, Department of Electrical and Computer Engineering,
The Johns Hopkins University, 2012-

Yi Yang, PhD, Department of Electrical and Computer Engineering,
The Johns Hopkins University, 2013.
Dissertation: *Multiple Access Interference Cancellation in Optical Code Division Multiple Access.*

Helene Tayong, Dr. Eng., Department of Electrical and Computer Engineering,
Morgan State University, 2006.
Dissertation: *Performance of Fast Frequency-Hopping Diversity Combiners in Multi Access Interference for Ad Hoc Networks.*

Master's Students Supervised

Yinan Zhao, *Rate Compatible Punctured Codes and Viterbi Decoders for Message Transmission at UHF.*, 2012

Lisa Martin, MSE, Department of Applied Mathematics and Statistics,
The Johns Hopkins University, 2010
Master's Essay: *Reed-Solomon Decoding: Run-Time Analysis of Algorithms Solving the Key Equation*

Patrick Mulligan, MSE, Department of Electrical and Computer Engineering,
Continuation of work as lab assistant and system builder begun in undergraduate years (see below).

Andrew Adams, prospective MS in ECE, Engineering and Applied Science Programs for Professionals (EPP),
The Johns Hopkins University, 2007
Independent Study Project: *Turbo Equalization for Fading Channels*

Helene Tayong, M. Eng., Department of Electrical and Computer Engineering,
Morgan State University, 2000.
Thesis: *Fuzzy Rank-Order Detectors for Fast Frequency Hopping Networks.*

Undergraduates Supervised at Hopkins

Maxwelll Doherty and Matthew DelGrosso, Senior Design Project, Spring 2013, *Android USB Router: Separating Device from Host.*

Guannan Ren and Weiwei Wu, Senior Design Project, Spring 2013, *MIMO Alamouti Schemes for Wireless Communications usig GNU Radio and USRP2*, Spring, 2012.

Weiwei Wu, *Optimizing Algorithms for Cognitive MIMO Networking*, 2012-2013 and *Sequences for OCDMA*, Spring, 2013.

Daniel Naito, *Simuations of OCDMA Systems*, Fall, 2011 and *Optimizing Algorithms for Cognitive MIMO Networking*. Spring, 2012.

Chen Chen, *Optimizing Algorithms for Cognitive MIMO Networking*, Spring/Summer, 2012.

Josh Blum and Rinat Zakirov, *Painless Digital Design with Intuitive Graphical Interfaces,* JHU Center for Technology Resources Technology Fellowship, 2008-2009.

Patrick Mulligan, Undergraduate Research (for credit) on
Software Radio Prototyping, Analysis and Design (2006); Building software radio platforms under William R. Kenan, Jr. Fund grant, *Hands-on Wireless System Design,* 2003 and JHU Center for Technology Resources Technology Fellowship, *Painless Radio Design,* 2006-2007.

Jason Rothhaupt, Independent Study (for credit)
Block Coding for Digital Communication, 2004.

Kaisha Askins, EE; Michael Carroll, CompEng; Levar Williams, CompEng
Senior Design Project, *Wireless MP3 System*, 2002.

Undergraduates Supervised Elsewhere

Mentored McNair Fellow, Kenny Byrd, on a *Code Diversity Experiment,* University of Delaware, 2001

Supervised two Senior Research Projects at Morgan State 1999, 2000.

Graduate Board Oral Exam (GBO) Committees

Yi Chen (ECE), 2011
Nilo Rivera (CS), 2008
Sam Small (CS), 2007
Adam Stubblefield (CS), 2005
Reza Curtmola (CS), 2005 (alternate member)
Carlos Salazar (ECE), 2003 (Alternate member)

External Examiner, PhD Dissertation

Tusli Pawan Fowdur
PhD in Communications Engineering (pending)
Advanced Error Control Coding Techniques
University of Mauritius,
Rèduit, Mauritius

PhD Committees at Hopkins (guest member)

Yu-sun Liu, PhD, March 1995,
Fundamental Performance Limits in Multiple-Access Communication Systems

Ramaswami Murali, PhD, September 1995,
The Effect of Forward-Error-Correction Coding on Performance in Packet Broadcasting Networks

Madhavi Subbarao, PhD, March 1998
On Optimizing Performance in Mobile Packet Radio Networks

PhD Committees at University of Delaware

Weifeng Su, PhD, ECE, 2002
Orthogonal Space-Time Block Codes for Wireless Communications.

Jose Paredes-Quintero, PhD, ECE, 2001
Stack Filters for Image and Signal Processing.

Alexander Flaig, PhD, ECE, May 2000
Near Field Spot Beamforming

Lisa Marvel, PhD, ECE, 1999
Spread Spectrum Image Steganography

Sudhakar Kalluri, PhD, ECE, May 1998
Nonlinear Adaptive Algorithms for Robust Signal Processing and Communications in Impulsive Environments

Maire Reavy, PhD, ECE, January, 1998
A New Algorithm for Bi-Level Image Compression

Juan Gonzalez, PhD, ECE, December, 1997
Robust Techniques for Wireless Communications in Non-Gaussian Environments

David Griffith, PhD, ECE, September, 1997
Robust Time-Frequency Representations for Signals in Alpha-Stable Noise

Ramesh Marasli, PhD, CIS, December, 1996
Performance Analysis of Partially Ordered and Partially Reliable Transport Services.

PhD Committees at University of Maryland Baltimore County

William R. Martin, PhD, December 2, 2003
The Weight Enumerator Function for RCD Array Codes, a Class of LDPC Codes.

Charles LaBerge, November 22, 2002
Multi-Stage Hybrid ARQ Protocols (Second reader.)

Yi Cai, PhD, May 2001
Forward Error Correction Codes and Line-coding Schemes in Optical Fiber Communications

JHU Courses

520.214 *Signals & Systems* (2006-2008, 2011)
520.460 *Error Control Codes,* (2001-2003, 2005-2006)
520.465 *Digital Communications I* (2002, 2004-2008)
520.466 *Digital Communications II* (2007)
520.766 *Seminar in Error Control Coding* (2005, 2007)
Computer Architecture I (1981) JHU Part-time program at Aberdeen Proving Ground
Computer Architecture II (1982) JHU Part-time program at Aberdeen Proving Ground

Research Laboratories

The *Software Radio Prototyping Laboratory* permits the design and implementation of a vast array of radio transmitters and receivers can be designed and implemented in computer software.

A *Multi-Access Fiber Optic Communications Testbed* is under development for the study of coherent multiple access schemes for fiber optic communications.

A testbed for *Cognitive MIMO Networking* is under construction, in collaboration with the US Army CERDEC.

Courses Elsewhere

Error Control Codes, Morgan State University (2000)
Wireless Digital Communications, Morgan State University (1999)
Digital Communications, Morgan State University (1998)
Topics in Multiuser Communications, University of Delaware (1998)
Digital Communications, Universty of Delaware (1996-1997)
Topics in Data Transmission Codes, University of Delaware (1996)
Computer Architecture, University of Delaware (1980-1984, 1988-1995)
Operating Systems, University of Delaware (1980-1984, 1989-1994)

Research Support

NOTE: Unless it is stated otherwise, A.B. Cooper III is the PI for all items.

William R. Kenan, Jr. Fund
An Interdisciplinary Simulation Laboratory in Fiber Optic Communications
$3771, 2012-2013

Battelle Memorial Institute, on behalf of the US Army Communications and Electronics Research, Development, and Engineering Center (CERDEC) *Optimizing Algorithm for Cognitive MIMO Networking* $8813, 2012-2013

National Science Foundation
A Key Enabling Technology for Optical Networks,
September 1, 2009, $336,239 for three years.

Dr. Michael Pascale, Engenium Technologies Corporation
Unrestricted gift *"to support the research of A. Brinton Cooper III in the ECE Department"*,
December 2008, $35,000

JHU Center for Educational Resources Technology Fellowship Program
Painless Digital Design with Intuitive Graphical Interfaces
May, 2008, $5,000

JHU Applied Physics Laboratory (APL) Partnership Fund
Joint with School of Medicine and APL - several investigators
Sensors and Tags for Detecting Surgical Leave Behind Objects - Year 2
February, 2007, $180,000 (shared)

JHU Center for Educational Resources Technology Fellowship Program
Painless Radio Design
June, 2006, $5,000

JHU Applied Physics Laboratory (APL) Partnership Fund
Joint with School of Medicine and APL - several investigators
Sensors and Tags for Detecting Surgical Leave Behind Objects
February, 2006, $120,000 (shared)

William R. Kenan, Jr. Fund
Hands-on Wireless System Design
October 01, 2003, $4,500

US Army Research Laboratory
Error Control Coding for Orthogonal Frequency Division Multiplexing OFDM
June, 2003, $40,000

US Army Research Laboratory
Error Control Coding for Orthogonal Frequency Division Multiplexing (OFDM)
June 2002, $40,000

US Army Research Laboratory
Detectors for Fast Frequency Hopping Communications
September 2001, $25,000

Pending proposals

Faculty researcher with Prof. Mark Foster, PI, and Prof. Khurgin: *Resource Efficient Ultrahigh-Speed Nyquist Optical Time Division Multiplexing*, November, 2013, NSF/CCSS.

Proposals not funded

Sole PI: *Improving OFDM Through Algebraic Coding*, December 2002, NSF/ITR, $465,477

Profs. Khurgin and Kang Co-PIs: *Non-binary Transmission for Improved Spectral Efficiency in Optical Fiber Communication*, May 2003, NSF, $581,033

Profs. Khurgin and Kang Co-PIs: *High Speed Fiber Optic Communication*, October 2003, NSF, $586,393

Profs. Khurgin and Kang Co-PIs: *Spectral-Phase Coding for Flexible, High-throughput Optical Networks*, February, 2004, NSF/ECCS, $528,246

Profs. Khurgin and Kang Co-PIs: *Nonbinary Coding, Modulation, and Signal Processing for High Speed Optical Communication*, March, 2004, NSF/CISE, $528,246

Profs. Khurgin and Kang Co-PIs: *High Capacity Communication and Sensor Networks using Multimode Fiber*, October, 2004, NSF/ECS $495,338

Profs. Khurgin and Kang Co-PIs: *Innovative Transceivers for Flexible, High-throughput Optical Networks*, October, 2004, NSF/ECS $501,224

Profs. Khurgin and Kang Co-PIs: *Theoretical Foundations of Optical Communications,* January, 2005, NSF/CISE, $505,093

Profs. Khurgin and Kang Co-PIs: *A Flexible Architecture for Optical Networking*, January, 2005, NSF/CISE, $717,050

Profs. Khurgin and Kang Co-PIs: *Hybrid Opto-Electronic Encoder for Optical Arbitrary Wave Generation*, February, 2005, DARPA/ATO $4,702,089 – Joint with UMBC

Prof. Khurgin, Co-PI: *Spectral Phase Coding for Information Dissemination,* October, 2005, National Reconnaissance Office, $195,637

Profs. Khurgin and Kang Co-PIs: *Phase and Polarization Diversity for Spectral Phase Coding in OCDMA*, February, 2006, NSF/CISE, $221,180

Prof. Khurgin Co-PI: *Collaborative Research: Scalable and Reconfigurable Optical Networking based on Spectral Phase Coding,* March, 2006, NSF/NeTS- NBD, $308,215 – Joint with UMBC

Sole PI: *A New Paradigm for Scalable and Reconfigurable Optical Networking,,* June, 2008, Hewlett-Packard Laboratories Innovation Research Program, $49,095.

Prof. Amy Foster, Co-PI and Prof. Khurgin: *Toward Useful Implementations of Optical Code Division Multiple Access (OCDMA): Overcoming the Technology Barrier*, February, 2012, NSF/ECCS, $405,544

Prof. Amy Foster, Co-PI and Prof. Khurgin: *Coherent OCDMA - A Multidisciplinary Approach for Overcoming Technological Barriers to Implementation*, November, 2012, NSF/CCSS, $455,742

PI, *A Key Enabling Technology for Digital Communications*, January, 2014, NSF/CISE/ $299,999.

Publications

Book Sections

"Communications and Information Theory," *CRC Handbook for Mechanical Engineers,* 1998.

"Soft Decision Decoding of Reed-Solomon Codes," Chapter 6 of *Reed-Solomon Codes and their Applications,* V.J. Barghava and S.B. Wicker, eds, IEEE Press, New York, 1994.

"Direct Solution of BCH Syndrome Equations," in *Communications, Control, and Signal Processing,* E Arkian, ed, Elsevier, New York, 1990.

"Algebraic Codes Constructed from other Algebraic Codes: A Short Survey and Some Recent Results," in *Communication Systems and Random Process Theory,* Sijthoff & Noordhoff, 1976, The Netherlands.

Journal Papers

Yang, Y., Perillo, K., Ting, H.-F, Khurgin, J., **A.B. Cooper III**, and Foster, M., "Experimental demonstration of coherent OCDMA using heterodyne detection," *Optics Letters*, 38(13), 2013.

Yang, Y., Foster, M., Khurgin, J.B., **A.B. Cooper III**, "Heterodyne detection using spectral line pairing for spectral phase encoding optical code division multiple access and dynamic dispersion compensation," *Optics Express,* 20(16), 2012.

A.B. Cooper III, J.B. Khurgin, S. Xu, and J.U. Kang, "Phase and Polarization Diversity for Minimum MAI in OCDMA Networks," *IEEE Journal of Selected Topics in Quantum Electronics,* special issue on "Code in Optical Communications and Networks," vol. 12, no. 5, Sep/Oct 2007.

B.L. Hughes and **A.B. Cooper III**, "Nearly Optimal Multiuser Codes for the Binary Adder Channel," *IEEE Transactions on Information Theory,* March, 1996, pp 387-398.

D. Kazakos and **A.B. Cooper III**, "Exponential Error Bounds for Coding Through Noisy Channels with Inaccurately known Statistics and for Generalized Decision Rules," *IEEE Transactions on Communications*, vol 41, pp 1329-1334, October 1993.

A.B. Cooper III, "Finding BCH Error Locator Polynomials in One Step," *Electronics Letters,* V27, n22, 24 October 1991.

W. E. Burr, A. C. Parker, D. R. Allison, **A.B. Cooper III**, and C. B. Silio Jr, "A Bus System for the Military Computer Family," *IEEE COMPUTER,* April 1979.

A.B. Cooper III and Willis C. Gore, "Iterated Codes with Improved Performance," *IEEE Transactions on Information Theory*, May 1978.

A.B. Cooper III and Willis C. Gore, "A Recent Result Concerning the Dual of Polynomial Codes," *IEEE Transactions on Information Theory*, vol IT-16, September 1970.

Willis C. Gore and **A.B. Cooper III**, "Comments on Polynomial Codes," *IEEE Transactions on Information Theory*, vol IT-16, September 1970.

R Adams Cowley, MD, **A.B. Cooper III**, David E. Towson, and Leonard Scherlis, MD, "A Statewide Communication System to Support a Regional Program for Emergency Health Care in Maryland," *Maryland State Medical Journal*, Baltimore, January 1973.

Invited Talks

"Fast Frequency Hopping for Multiuser Communications," presented to the Washington, DC, Chapter, IEEE Communications Society, George Washington University, March 15, 2001.

"Fast Frequency Hopping with MFSK for Wireless Networks," presented to the Electrical Engineering Graduate Seminar, University of Maryland Baltimore County, March 9, 2001.

Expert Speaker, Panel Session on "Military and Commercial Communications Systems; Similarities and Differences," *International Symposium on Computers and Communications,* Athens, Greece, June 30, - July 2, 1998.

"Sequence Demodulation in Impulsive Noise," *International Conference on Telecommunications,* Chalkidiki, Greece, June 22-25, 1998.

"Adaptive Reception in Impulsive Noise," *WINLAB Seminar,* Rutgers University, Dec 10, 1997.

"Mixed Rate Multiuser Codes for the T-user Binary Adder Channel," Department of Electrical Engineering, University of Delaware, November 20, 1995.

"Toward a New Method of Decoding Algebraic Codes using Gröbner Bases," *Proceedings, Tenth Army Mathematics Conference,* Mathematics Department, US Military Academy, West Point, June 16, 1992.

"Decoding using Gröbner Bases," Mathematical Sciences Institute, Symbolic Computing Seminar, Cornell University, December 11, 1991.

"New Techniques for Decoding BCH Codes," Department of Electrical Engineering, University of Maryland Baltimore County, March 1, 1991.

"Direct Solutions of BCH Syndrome Equations," Department of Electrical Engineering, Stanford University, October 3, 1990.

"An Application of Gröbner Bases in Algebraic Error Control Decoding," Graduate Communications Seminar, Electrical and Computer Engineering, The Johns Hopkins University, April 2, 1990.

"An Application of Gröbner Bases in Algebraic Error Control Coding," Computer Algebra Seminar, Department of Computer and Information Sciences, University of Delaware, March 12, 1990.

"Topics in Robust Networking," Center for Intelligent Control Systems (MIT, Harvard, Brown), Cambridge, MA, September 25, 1989.

"Gröbner Bases and Algebraic Coding," School of Electronic Engineering Science, University College of North Wales, Bangor, July 4, 1989.

"Gröbner Bases and Algebraic Coding," Electrical Engineering Department, Manchester University, Manchester, UK, July 6, 1989.

Conference Papers

Y. Yang, K. Petrillo, H.-F Ting, J. Khurgin, **A.B. Cooper III**, and M. Foster, "Experimental Demonstration of Coherent OCDMA using Spectral Line Pairing and Heterodyne Detection," *OSA CLEO 2013*.

Y. Yang, K. Petrillo H.-F Ting, J. Khurgin, **A.B. Cooper** and M. Foster, "Simulation and experimental demonstration of coherent OCDMA using spectral line pairing and heterodyne detection," *47-th Annual Conference on Information Sciences and Systems,* Johns Hopkins University and IEEE Information Theory Society, Baltimore, March 20-23, 2013.

Y. Yang, **A.B. Cooper III**, J. Khurgin, J. Kang, "Sequences for Impairment Mitigation in Coherent SPE-OCDMA," *IEEE Photonics 2011 Conference (IPC11)*, IEEE Photonics Society, Arlington, October 9-13, 2011.

Y. Yang, **A.B. Cooper III**, J. Khurgin, J. Kang, "Coherent OCDMA without Polarization Stabilization," *2011 Signal Processing in Photonics Communications (SPPCom) Topical Meeting*, Optical Society of America, Toronto,

June 12-16, 2011.

Y. Yang, **A.B. Cooper III**, J. Khurgin, J. Kang, "Robustness of Coherent SPE-OCDMA to Combined Dispersion Impairments," poster presentation, *2011 Conference on Lasers and Electro-Optics (CLEO '11)*, Optical Society of America, Baltimore, 1-6 May 2011.

Y. Yang, **A.B. Cooper III**, J. Khurgin, J. Kang, "Coherent OCDMA Receivers with Robust Performance," *45-th Annual Conference on Information Sciences and Systems,* Johns Hopkins University and IEEE Information Theory Society, Baltimore, March 23-25, 2011.

Rivera, N.; Mountain, R.; Assumpcao, L.; Williams, A.A.; **A.B. Cooper III**; Lewis, D.L.; Benson, R.C.; Miragliotta, J.A.; Marohn, M.; Taylor, R.H. "ASSIST - Automated System for Surgical Instrument and Sponge Tracking," *Proc., 2008 IEEE International Conference on RFID,* Las Vegas, 16-17 April 2008.

A.B. Cooper III, J.B. Khurgin, S. Xu, J.U. Kang, "High Spectral Effciency Phase Diversity Coherent Optical CDMA with low MAI," poster presentation, *2007 Conference on Lasers and Electro-Optics (CLEO '07)*, Optical Society of America, Baltimore, May 6-11, 2007.

A.B. Cooper III, J.B. Khurgin, S. Xu, J.U. Kang, "Coherent Optical CDMA with low MAI," *Proc. 41-st Annual Conference on Information Sciences and Systems,* The Johns Hopkins University, Baltimore, March, 2007.

J. B. Khurgin, **A.B. Cooper**, P.S. Cho, I. Shpantzer, "Painless Fully Orthogonal Coherent OCDM," *Coherent Optical Technologies and Applications*, Optical Society of America, June 25-30, 2006, Westin Whistler Resort & Spa, Whistler, British Columbia, Canada

A.B. Cooper III, J.B. Khurgin, J.U. Kang, "Phase and Polarization Diversity for OCDMA," *2006 Conference on Lasers and Electro-Optics (CLEO '06)*. Optical Society of America, Long Beach, CA USA, May 21-26, 2006

H. Tayong, A. Cole-Rhodes, **A.B. Cooper III,**, "Evaluating the performance of reduced fuzzy rank order detector (R-FROD) in an alpha stable environment," *Proceedings, 39-th Annual Conference on Information Sciences and Systems,* The Johns Hopkins University, Baltimore, March, 2005.

H. Tayong, A. Cole-Rhodes, **A.B. Cooper III,**, "Assessing the Performance of Fast Frequency-Hopping Diversity Combiners for Mobile Ad Hoc Networks," *Proceedings, 37-th Annual Conference on Information Sciences and Systems,* The Johns Hopkins University, Baltimore, March, 2003.

H. Tayong, A. Beasley, A. Cole-Rhodes, **A.B. Cooper III,** "Adaptive Optimization of a Parametric Receiver for Fast Frequency Hopping, *Proceedings, 36-th Annual Conference on Information Sciences and Systems,* Princeton, March 21, 2002.

D.D. Mills, **A.B. Cooper III**, C. Retter, "Correlation and linear span properties of nonlinear binary sequences generated by elements of large orders," *Proceedings, 8th Annual ARL/US Military Academy Technical Symposium*, (non-refereed).

H. Tayong, A. Beasley, A. Cole-Rhodes, **A.B. Cooper III,** G.R. Arce, "Bandwidth Efficiency in Fast Frequency Hopping Multiple Access," *Proceedings, 35-th Annual Conference on Information Sciences and Systems,* The Johns Hopkins University, Baltimore, 23 March 2001.

H. Tayong, A. Beasley, A. Cole-Rhodes, **A.B. Cooper III**, G.R. Arce, "Parametric Diversity Combining in Fast Frequency Hopping," *Proceedings, ARL Federated Laboratory 2001 Capstone Symposium,* College Park, March 22, 2001

D.D. Mills, **A.B. Cooper III**, C. Retter, "Correlation Properties of Sequences Generated by Polynomial Compositions," *Proceedings, 8th Annual ARL/US Military Academy Technical Symposium*, Aberdeen Proving Ground, November 2000 (non-refereed).

H. Tayong, A. Cole-Rhodes, **A.B. Cooper III**, A. Flaig, G.R. Arce, "Exploiting the Energy Distribution in Non-Coherent Frequency Hopping Diversity Combining," *Proceedings, 34-th Annual Conference on Information Sciences and Systems,* Princeton, March, 2000.

H. Tayong, A. Cole-Rhodes, **A.B. Cooper III**, A. Flaig, G.R. Arce, "A Reduced Complexity Detector for Fast Frequency Hopping," *Proceedings, 2000 ARL Federated Laboratory Symposium,* College Park, March 2000.

G.R. Arce, S. Kalluri, and **A.B. Cooper III**, "Maximum Likelihood Decoding of Convolutional Codes for Non-Gaussian Channels," *Applications of Heavy Tailed Distributions in Economics, Engineering and Statistics,* American University, Washington, DC, 3-5 June 1999.

Sudhakar Kalluri, Gonzalo Arce, **A.B. Cooper III**, "Optimal Sequence Estimation for Non-Gaussian Channels with Intersymbol Interference," invited talk in session on Non-Gaussian Processes in Communications, *Proceedings, 33-rd Annual Conference on Information Sciences and Systems,* The Johns Hopkins University, Baltimore, March 1999 (presented by Kalluri).

A. Flaig, G.R. Arce, **A.B. Cooper III**, "Rank-Order Diversity Detectors for Wireless Communications in Hostile Environments," *Proceedings, 1999 ARL Federated Laboratory Symposium,* College Park, February 1999.

A. Flaig, G.R. Arce, **A.B. Cooper III**, H. Tayong, and A. Cole-Rhodes, "Fuzzy Rank-Order Detectors for Frequency-Hopping Networks," *Proceedings, 1999 ARL Federated Laboratory Symposium,* College Park, MD, February 1999.

M. Henry, C. B. Silio, and **A.B. Cooper III**, "Concurrent Communication in Ring Networks," *Proceedings, 32-nd Annual Conference on Information Sciences and Systems,* Princeton, March 1998.

A.B. Cooper III, "Sequence Demodulation in Impulsive Noise," *Conference to Honor Prof. P. G. Farrell,* Lancaster, UK, January 13, 1998.

J. G. Gonzalez, D. W. Griffith, **A.B. Cooper III**, and G. R. Arce, "Adaptive Reception in Impulsive Noise," *Proceedings, 1997 IEEE International Symposium on Information Theory,* Ulm, Germany, July 1, 1997.

C. B. Silio, M. Henry, and **A.B. Cooper III**, "Packet Departure Rates in Ring Networks, *Proceedings, 31-st Annual Conference on Information Sciences and Systems,* The Johns Hopkins University, Baltimore, March 1997.

J.G. Gonzalez, D.W. Griffith, **A.B. Cooper III**, G.R. Arce, "Robust Adaptive Receivers for Channels with Uncertain Impulsiveness," *Proceedings, 1997 ARL Telecommunications Federated Laboratory Symposium,* January 21-22, 1997.

A.B. Cooper III and B.L. Hughes, "Mixed-Rate Multiuser Codes for the T-user Binary Adder Channel," *Proceedings, 1995 IEEE International Symposium on Information Theory,* Whistler, B.C., September 17-22, 1995.

A.B. Cooper III and B.L. Hughes, "A Class of Nearly Optimal Multiuser Codes: Construction, Performance, and Application," *Proceedings, Annual 29-th Conference on Information Sciences and Systems*, The Johns Hopkins University, 22 March 1995.

A.B. Cooper III and B.L. Hughes, "Coding for Improved Tactical Channel Sharing," *Nineteenth Army Science Conference,* Orlando, June 22, 1994. (Judged **Best in Session** in the Signal and Image Processing Session.)

C. B. Silio and **A.B. Cooper III**, "Markov Chain Analysis of MARILAN," *Proceedings, 27-th Annual Conference on Information Sciences and Systems,* The Johns Hopkins University, Baltimore, March 25, 1993.

A.B. Cooper III and B.L. Hughes, "Optimal Multiuser Codes for the Real Adder Channel," *Proceedings, 1993 International Symposium on Information Theory,* San Antonio, January 17-22, 1993.

A.B. Cooper III, "Toward a New Method of Decoding Algebraic Codes using Gröbner Bases," *Proceedings, Tenth Army Conference on Mathematics and Computing,* U.S. Military Academy, West Point, June 16, 1992.

A.B. Cooper III, "One Step Algorithm for finding BCH Error Locator Polynomials," *Proceedings, 1991 IEEE International Symposium on Information Theory,* Budapest, June 23-28, 1991.

D. Kazakos and **A.B. Cooper III**, "Exponential Error Bounds for Coding through Noisy Channels with Inaccurately Known Statistics and for Generalized Decision Rules," *Proceedings, 25-th Conference on Information Sciences and Systems*, The Johns Hopkins University, Baltimore, 20 March 1991.

A.B. Cooper III, "Direct Solution of BCH Syndrome Equations," *1990 Bilkent Conference on New Trends in Communications, Control, and Signal Processing,* Bilkent University, Ankara, July 1990.

A.B. Cooper III, "New Techniques for Decoding BCH Codes," *Proceedings, 24-th Annual Conference on Information Sciences and Systems,* Princeton, March 22, 1990.

A.B. Cooper III, "Toward the Direct Solution of BCH Decoding Equations," *1990 IEEE International Symposium on Information Theory* (Session on "Recent Results"), San Diego, January 16, 1990.

A.B. Cooper III, "Protection of Multiuser Systems–An Open Question," *Discussion Panel on Reliability as a Performance Limit,* NATO Advanced Study Institute on Performance Limits in Communications, Castelvecchio Pascoli, Italy, August, 1986.

A.B. Cooper III, "Further Improvements to Iterated Codes," *Abstracts of Papers of the 1985 IEEE International Symposium on Information Theory*, Brighton, UK, June 25, 1985.

A.B. Cooper III, "TACFIRE Communications," *Fall Technical Conference,* US Army Ballistic Research Laboratory, Aberdeen Proving Ground, October 17, 1984.

A.B. Cooper III, "Code Iteration for Noisy Channels," *Transactions of the Second Army Conference on Applied Mathematics and Computing*, Troy, 22 May 1984.

A.B. Cooper III and P. J. Randall, "Software Evaluation Using a Case Study," *Proceedings, DARCOM Tactical Computer Software Conference*, Ft. Monmouth, November 1978.

A.B. Cooper III, "Algebraic Codes Constructed from Other Algebraic Codes: A Short Survey and some Recent Results," NATO Advanced Study Institute on Communications Systems and Random Process Theory, Darlington, UK, July 1977.

A.B. Cooper III, "Improved Iterative Codes," *Proceedings, 1976 Conference on Information Sciences and Systems*, The Johns Hopkins University, Baltimore, March, 1976.

A.B. Cooper III, "Comments on 'Coding for Duplex Channels,' by Prof J P M Schalkwijk", *New Directions in Signal Processing and Control*, NATO Advanced Study Institute, Darlington, UK, August, 1974.

Technical Reports

A.B. Cooper III and B.L. Hughes, *A Class of Nearly Optimal Multiuser Codes: Construction, Performance, and Application.* Technical Report JHU/ECE 95-15, Department of Electrical and Computer Engineering, The Johns Hopkins University.

B.L. Hughes and **A.B. Cooper III**, *Nearly Optimal Multiuser Codes for the Binary Adder Channel,* Technical Report JHU/ECE 94-20, Department of Electrical and Computer Engineering, The Johns Hopkins University, September 15, 1994.

Toward a New Method of Decoding Algebraic Codes using Gröbner Bases, US Army Research Laboratory, ARL-TR-293, October 1993.

D. Kazakos and **A.B. Cooper III**, *Exponential Error Bounds for Coding Through Noisy Channels with Inaccurately Known Statistics and for Generalized Decision Rules,* US Army Ballistic Research Laboratory, BRL-TR-3307, January 1992.

A.B. Cooper III, *Coding Gains for Rank Decoding*, US Army Ballistic Research Laboratory Memorandum Report, MR-3809, February 1990.

A.B. Cooper III, *Soft Decision Decoding of Block Codes*, US Army Ballistic Research Laboratory Memorandum Report MR-3721, December 1988.

A.B. Cooper III, *Modeling Degraded Communications in ACE - I,* US Army Ballistic Research Laboratory Memorandum Report MR-3541, August 1986.

A.B. Cooper III, *TACFIRE Error Control: Improvements Using Iterated Codes*, US Army Ballistic Research Laboratory Memorandum Report MR-3453, June 1985.

A.B. Cooper III, *Code Iteration for Noisy Channels*, US Army Ballistic Research Laboratory IMR 800, December 1983.

A.B. Cooper III, G.W. Tyler, *Alternatives for Field Artillery Fire Direction*, CSD Interim Note No. 42, US Army Materiel Systems Analysis Activity, December 1974.

A.B. Cooper III, *Selected Problems Concerning Vehicular Antennas*, CSD Interim Note No. 34, US Army Materiel Systems Analysis Activity, July 1974.

A.B. Cooper III, *TACSATCOM vs Conventional Communications for Long Range Patrols*, CSD Interim Note No. 2, US Army Materiel Systems Analysis Activity, September 1970.

A.B. Cooper III, *The Maximum Capacity of Tactical Satellite Communications Designs*, AMSAA TM-51, US Army Materiel Systems Analysis Activity, October 1969.

Co-author, *Solid State UHF Repeater/Amplifier*, Rome Air Development Center, RADC-TR-97-93, May 1967.

Co-author, *Subsequence Correlation Analysis*, Rome Air Development Center, RADC-TR-591, October 1967.

Co-author, *Continuous Random Analog Frequency Transmission*, Rome Air Development Center, RADC-TR-68-156, October 1968, and RADC-TR-66-232, March 1966.

Professional and Organizational Service

Other Service to Johns Hopkins

Designed the *Focused MSE Program in Communication Science* and built the ECE web page, "Focused MSE in Communications."

Actively participated in ECE faculty recruitment program, 2013.

Technical Program Chair, 47-th Annual Conference on Information Sciences and Systems, CISS'13, The Johns Hopkins University, Baltimore, March 20-22, 2013.

Technical Program Chair, 45-th Annual Conference on Information Sciences and Systems, CISS'13, The Johns Hopkins University, Baltimore, March 23-25, 2011.

Member, Computer Engineering Committee, ECE Department, 2002-2008.

Technical Program Director, 41-st Annual Conference on Information Sciences and Systems, CISS'07, The Johns Hopkins University, Baltimore, March 14-16, 2007.

Technical Program Director, 39-th Annual Conference on Information Sciences and Systems, CISS'05, The Johns Hopkins University, Baltimore, March 16-18, 2005.

Co-Director, 37-th Annual Conference on Information Sciences and Systems, CISS'03, The Johns Hopkins University, Baltimore, March 12-14, 2003.

Presentation, *Communication Research and Teaching in ECE at Hopkins,* to the 2002 ECE External Advisory Committee.

Conference Service

Technical Program Committee, *IEEE Wireless Networking Theory Symposium, ICC 2002*, April, 2002.

Technical Program Committee, *Army Research Laboratory Communications and Networks Cooperative Technology Alliance Symposium,* 2002.

Session Chair, *36-th Annual Conference on Information Sciences and Systems,* Princeton, 2002

Organizing Committee, *2001 IEEE-EURASIP Workshop on Nonlinear Signal and Image Processing*, Baltimore, June 3-6, 2001.

Session Chair, "Coding II," and "Communications II," *35-th Annual Conference on Information Sciences and Systems,* The Johns Hopkins University, Baltimore, 2001

Technical Program Committee, *2000 IEEE Wireless Communications and Networking Conference,* Chicago

Organizer and Chair of Special Session, "Non-Gaussian Processes in Communications," *33-rd Annual Conference on Information Sciences and Systems,* The Johns Hopkins University, Baltimore, 1999

Session Chair, "Communication Networks," *31-st Annual Conference on Information Sciences and Systems,* The Johns Hopkins University, Baltimore, 1997.

Chair, *Workshop on Routing in Wireless Networks,* US Army Research Laboratory and the Johns Hopkins University, Aberdeen Proving Ground, MD, 28 August 1995

Session Chair, "Communication Networks," *29-th Annual Conference on Information Sciences and Systems,* The Johns Hopkins University, Baltimore, 1995

Session Chair, "Communication Networks I," *25-th Annual Conference on Information Sciences and Systems,* The Johns Hopkins University, Baltimore, 1991

Session Chair, "Modulation," *1990 IEEE International Symposium on Information Theory,* San Diego, 16 January 1990

Peer Reviews

National Science Foundation proposal review panels, 1988, 2002 (2), 2004, 2007, 2009

Visiting Committee, Department of Electrical & Computer Engineering, University of Delaware, 2000-01.

Peer reviews for: *IET Optoelectronics*, *IEEE Photonics Technology Letters*, *IEEE Communications Letters*, *Optics Letters* (OSA); *IEEE Transactions on Information Theory*; *IEEE Transactions on Communications*; *IEEE International Symposium on Information Theory*; *Conference on Information Sciences and Systems*; *IEEE International Communication Conference*.

Proposal reviews for: Army Research Office, Army Research Laboratory, Assistant Secretary of the Army for R&D.

Program Review Panels

US Office of Naval Research Technical Review Committee for *DoD Multi University Research Initiative (MURI) in Adaptive Wireless Networks,* Clemson and Cornell Universities, May, 2000.

US Office of Naval Research, *Review of Basic and Applied Research in Radio Communications and Wireless Networks*, 5-7 January 1999, San Diego.

US Army Research Office, *Electronics Division Program Review,* 1998.

DoD Program Review, *Wireless Communications and Networking, Center for Wireless Communications,* Clemson University, 1998.

Technical Advisory Council, *US Army Center on Intelligent Control Systems* (MIT, Harvard, Brown), 1993-1995 (appointed by Assistant Secretary of the Army for R&D).

Electronics Coordinating Group, US Army Research Office, Research Triangle Park, NC.

Other Organizational Service

IEEE Admission and Advancement Committee, 30 September 2000, Baltimore.

ARL Panel for postdoctoral fellowships awarded through the American Society for Engineering Education and the National Research Council, 1991-1998.

Panel on Standardization and Accreditation of Computer Architecture, Second Software Workshop (Joint Logistics Commanders), Monterey, CA, 22-25 June 1981.

Panel on Software Acceptance Criteria, (First) Software Workshop (Joint Logistics Commanders), Monterey, CA, 2-5 April 1979.

Community Service

Science Fair Judge, Harford County (MD) Public Schools, multiple years.

Computer Merit Badge Counselor, Harford District, Boy Scouts of America, multiple years.

Volunteer Tutor to Harford County, MD, high school students, multiple years.

Former player and founding chair of the board, Harford Community Symphony Orchestra, Bel Air, MD.

Memberships

Life Senior Member, IEEE and of the IEEE Information Theory, Communications, Signal Processing, and Photonics Societies