CHRISTOPHER P. THRON

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## OBJECTIVE

The creative and beneficial use of mathematics to solve important practical problems.

## SUMMARY

Research: Mathematical and statistical modeling in wireless communications, physics, social sciences, epidemiology, and operations research. Proven innovator with nine patents granted. Strong verbal and written communication skills, with publications in refereed journals & presentations at professional conferences.

Teaching: Undergraduate and graduate-level mathematics instruction in the U.S., Cameroon, Chad, Nigeria, and China. Founding member of TAMU-CT mathematics department; played a key role in developing the master's program. Guided undergraduate and graduate students in research, resulting in several publications and conference presentations. Developed and promoted progressive instructional methods in computational mathematics and statistics in five African universities. Development of online, open-source instructional materials, including textbooks, tutorials, and videos.

Expertise includes:

Subject areas: mathematical modeling, Monte Carlo simulation, optimization, numerical analysis, applied statistics

Applications: wireless communication systems design and analysis; digital signal processing; sociological and biological modelling; mathematical physics; public health statistics: operations research.

Programming: Matlab/Scilab/Octave/Mathematica /Sage/Maxima/LaTeX

Languages: French & Chinese

## ACADEMIC EXPERIENCE

TEXAS A&M UNIVERSITY CENTRAL TEXAS, Killeen TX Fall 2009 – Present

Associate Professor of Mathematics (tenured August 2015) and chairman of the Department of Sciences and Mathematics (appointed September 2014)

- Undergraduate courses taught include: Probability of Statistics, Differential Equations, Algebraic Functions, Discrete Mathematics, Numerical Analysis, College Geometry, Mathematical Modeling, Linear Algebra, Abstract Algebra, Actuarial Mathematics

- Graduate courses taught include: History of Math, Abstract Algebra, Operations Research, Topology, Linear Algebra, Numerical Analysis, Theory of Functions, Mathematical Modeling
- Pursues collaborative research in wireless communication systems, modeling and simulation with biological and sociological applications, numerical analysis, and applied statistics.
- Master's thesis advisor for three graduated and two current students.This work produced five conference presentations and two published journal papers.
- Mentored two undergraduate research projects, resulting in two award-winning conference papers.
- Mentored several graduate research projects, resulting in two conference presentations, one published paper, and one paper to be submitted.

UNIVERSITY OF N'DJAMENA and UNIVERSITY OF SARH (Chad, Africa) May 2014 – July 2014

Visiting Professor of Mathematics:

- Taught Numerical Analysis and Mathematical Software (in French) to upper-level undergraduate students. Developed all curriculum used (in French). Created instructional videos to aid in learning programming techniques.

U.S. STATE DEPARTMENT Feb 2013 – Jan 2014

Fulbright Professor of Mathematics, University of Maroua and University of N'Gaoundéré, Cameroon, Africa

- Taught 10 upper-level mathematics classes to masters' students in engineering at three different universities in Chad and Cameroon. Courses included numerical analysis, differential equations, mathematical modeling in telecommunications, and mathematical software. I developed my own curriculum, and delivered all lectures in French. Several classes had 40+ students.
- Delivered several seminars (in French) on mathematical modeling at the University of N'Djaména, (Chad), University of Maroua, and University of N'Gaoundéré.
- Conducted research in optimization of mesh router node placement, mathematical modeling of spread of plant disease, and conflict in ethnically or religiously divided communities. Research resulted in two joint papers and four conference presentations.

CAPELLA UNIVERSITY, Minneapolis MN 2009

Adjunct Instructor in Mathematics (Part-time)

- Completed training course for online instructors; Taught two sections of College Algebra.

AUSTIN COMMUNITY COLLEGE, Austin TX 2008-2009
Adjunct Instructor in Physics (Part-time)

- Taught conceptual physics and engineering physics courses at the first-year college level.
- Student evaluations consistently meet or exceed course averages.

AUSTIN INDEPENDENT SCHOOL DISTRICT, Austin TX 2008-2009
Mathematics and Physics teacher

- Participated in teacher certification program (T.E.A.C.H. Quest, Austin ,TX)
- Taught high school math and physics classes at LBJ High School and Anderson High School

BAYLOR UNIVERSITY, Austin TX 1998, 2009

Adjunct Professor of Physics (Part-time)

- Taught graduate quantum mechanics and graduate classical mechanics

U.S. STATE DEPARTMENT 2004

Fulbright Professor Of Mathematics, University of N'Djaména, Chad, Africa

- Taught advanced college mathematics in Third-World university under the auspices of U.S. government-sponsored Fulbright Fellowship program.
- Developed the curriculum for courses in partial differential equations, probability, and applied mathematics (50 students total); taught courses in French.
- Delivered seminars, public lectures, and international conference presentations on communications technology in Chad and Benin, in French.

KING COLLEGE, Bristol, TN 1991-1993
Assistant Professor of Mathematics and Physics

- Taught undergraduate courses in differential equations, statistics, atomic physics, and conceptual physics.
- Obtained NSF grant to develop innovative course in computational statistics, which focused on quality control and business applications.
- Mentored students in mathematical physics research (resulted in one publication).

MINISTRY OF EDUCATION, People's Republic of China 1985-1990

Foreign Expert in English and Mathematics

- Taught math and ESL at three different universities in China (Shaanxi University of Science and Technology; Shanghai Jiao Tong University; Southern Yangtze University)
- Taught undergraduate courses in calculus, linear algebra and probability; taught graduate courses in probability and statistics, stochastic processes.
- Taught comprehensive English as a second language at undergraduate, graduate, and post-graduate levels
- Conducted research and published one joint paper (in Chinese) on modeling of ocean waves' effect on drilling platforms

## INDUSTRY EXPERIENCE

METAL NETWORKS, INC., Houston Texas 2014-present

- Mathematician/Consultant (contract, per-project basis)
- Development of flexible, intelligent algorithms for inventory data processing.

APPLIED MATHEMATICS, INC., Gales Ferry, Connecticut 1991-present

Mathematician/Consultant (contract, per-project basis)

Research and development in tracking, search, and scheduling algorithms with naval, industrial, and homeland security applications.

- Developed and documented statistical algorithms for naval search and target track estimation
- Wrote technical portion of small-business grant proposal for development of statistical hazardous chemical identification methodology (U.S. Department of Homeland Security)

FREESCALE SEMICONDUCTOR, Austin TX 2008-2009
Information Developer (Network and Multimedia Group)

- Developed technical documentation for multimedia & networking devices.

FREESCALE SEMICONDUCTOR, Austin TX 1998-2007

Senior Engineer:

Research and development in wireless (cellular) signal processing, network applications, device modeling and performance.

- Designed, simulated (in Matlab) and verified novel noise-reduction scheme for signal direction finding in 3G CDMA (cellular) adaptive antenna system.
- Modeled (in Matlab and C), evaluated, and optimized adaptive beamforming algorithms (LMS, NLMS, RLS) for 3G CDMA.
- Used Matlab and C models to optimize design and parameters for cellular CDMA baseband signal processing algorithms.
- Implemented mathematical algorithms (Cholesky decomposition, FFT) for signal processing on embedded device, which significantly improved performance (2x or more) and reduced cost (more than 5x).
- Wrote Matlab and C++ models for performance analysis of network security algorithms.
- Wrote Matlab model for performance analysis of projected multicore device, which was the primary input for several key design decisions.
- Obtained nine U.S. patents (plus one pending) for innovative algorithms with various applications (smart antenna signal acquisition, wireless baseband processing, amplifier predistortion, network security, video image processing).
- Developed and delivered video course in wireless technology for Freescale internal use.
- Delivered several presentations at technical & trade conferences.

NEC AMERICA, INC., Irving, TX 1995-1998

Senior Engineer

- Provided systems-level support in design of CDMA (IS-95A) subscriber unit.
- Mathematically simulated noise power levels and false-alarm probabilities.
- Developed documentation for development phase of IS-95A subscriber unit.
- Project management
- Co-wrote two patent applications for baseband filter implementation

REFEREED PUBLICATIONS AND TRADE JOURNALS

C. Thron, “Lifestyle Tradeoffs and the Decline of Societal Well-Being: An Agent-Based Model.” Journal of Artificial Societies and Social Simulation (2016) 19(2).

O. J. Awoleye and C. Thron, “Improving Access to Malaria Rapid Diagnostic Test in Niger State, Nigeria: An Assessment of Implementation up to 2013”, Malaria Research and Treatment (2016), http://dx.doi.org/10.1155/2016/7436265.

C. Thron and A. Aziz, "Algebraic method for optimal beamforming in two-way relay systems with analog network coding." 2015 IEEE International Symposium on Signal Processing and Information Technology (ISSPIT). 2015.

O. J. Awoleye and C. Thron, “Determinants of human immunodeficiency virus (HIV) infection in Nigeria: A synthesis of the literature,” Journal of AIDS and HIV Research (2015) 7(9).

C. Thron, “An Accumulative Model for Quantum Theories,” Electronic Journal of Theoretical Physics (2015) Vol. 12(33).

D. Fotsa, C. Thron, "Optimal control of anthracnose using mixed strategies," Mathematical Biosciences 269 (2015): 186-198.

C. Thron, V. Miller, “Persistent Confusions about Hypothesis Testing in the Social Sciences,” Social Sciences (2015) Vol. 4(2): 361-372.

C. Thron, A. Aziz, “Very Low Complexity Algorithms for Beamforming in Two-Way Relay Systems,” Imhotep: African Journal Of Pure And Applied Mathematics (2015) Vol.2(1): 13-24.

J.-L. Fendji, C. Thron, J. M. Nlong, “A Metropolis Approach for Mesh Router Nodes placement in Rural Wireless Mesh Networks,” Journal of Computers (2015) Vol.10(2): 101-114.

D. Fotsa, E. Houpa, D. Bekolle, C. Thron, M. Ndoumbe, “Mathematical modelling and optimal control of anthracnose,” Biomath 3 (2014), pp. 1-16.

A. Aziz, C. Thron, S. Cui, C. Georghiades, “Linearized Robust Beamforming for Two-Way Relay Systems,” IEEE Signal Processing Letters, 21(8), (August 2014), 1017-1021.

C. Thron, “Frogs in a Pot: an Agent-based Model of Well-being versus Prosperity,” Social Computing, Behavioral–Cultural Modeling, and Prediction (7th International Conference Proceedings), Springer, April 2014.

Fendji, J.L. E. K.,Thron,C., & Nlong,J.M.: Mesh router nodes placement in rural wireless mesh networks. In M.Sellami, E.Badouel, & M.Lo (Eds.), Actes du CARI 2014 (Colloque Africain Sur LA Recherche en Informatique et Mathématiques Appliquées). Inria:Colloques CARI, pp. 265-272.

C. Thron, J. Watts, “A Signal Processing Model of Quantum Mechanics,” African Review of Physics, vol. 8 (2013).

C. Thron, E. Jackson, “Practicality of Agent-Based Modeling of Civil Violence: an Assessment,” IOSSBR Journal of Social Sciences Research, vol. 2 (2013).

J. Moten, C. Thron, ”Improvements on Secant Method for Estimating Internal Rate of Return (IRR),” International Journal of Applied Mathematics and Statistics, 42, 12 (2013).

C. Thron, J. Salerno, A. Kwiat, P. Dexter, J. Smith, “Modeling South African Service Protests Using the National Operational Environment Model” in Social Computing,

Behavioral–Cultural Modeling, and Prediction (5th International Conference Proceedings), Springer, April 2012.

C. Thron, “Beyond Regression: Line-fitting algorithms for exceptional cases fitting (Parts 1,2,3)” EE Times Online (http://www.eetimes.com/design/other/4199749/Line-fitting-algorithms-for-exceptional-cases-minimax-line-fitting), June 1 2010.

C. Thron, “Fast, Accurate Math Functions on Parallel Devices’“ Embedded.com (http://www.embedded.com/showArticle.jhtml?articleID=47901094), September 22, 2004

C. Thron, S.J. Dong, K.F. Liu, and H.P. Ying, "Padé-Z2 estimator of determinants’“ Physical Review D 57, 3 (1998) 1642.

C. Thron, K.F. Liu, and S.J. Dong, “The PZ method for estimating determinant ratios, with applications’“ Nuclear Physics B (Proc. Suppl.) 53 (1997), 977-979.

S. Bernardson, P. McCarty, and C. Thron, “Efficient methods for Monte Carlo inversion of quark matrices’“ Nuclear Physics B (Proc. Suppl.) 34 (1994), 759-761.

S. Bernardson, P. McCarty, and C. Thron, "Monte Carlo Methods for Estimating Linear Combinations of Inverse Matrix Entries in Lattice Q.C.D.’“ Computer Physics Communications 78 (1994), 256-64.

C. Thron, "Taylor series expansions for Eigenvalues and Eigenfunctions of parametrized composition operators’“ Journal of Mathematical Physics 35 (April, 1994), 2024-35.

C. Thron, "Taylor Series Expansion of the Dominating Eigenvalue of the Ruelle-Araki Transfer Operator’“ Journal of Mathematical Physics 32 (10), October 1991.

## BOOKS / BOOK CHAPTERS

W. Wilcox, C. Thron, “Advanced Electrodynamics, an Introductory Graduate Treatment,” World Scientific, January 2016.

J. Hill, C. Thron et al. “Elementary Abstract Algebra: Examples and Applications,” Lulu, 2015. (Online version: http://sl2x.aimath.org/book/aafmt/)

C. Thron, C. Sheng, L. Turner, “High Performance Path Searcher for CDMA Adaptive Antenna Systems’“ in Chandran, S. (ed), Adaptive Antenna Arrays, Trends and Applications, Springer, 2004.

C. Sheng, C. Thron, “Impact on System Performance of Weight Update Rate for NLMS Adaptive Antennas’“ in Chandran, S. loc. cit.

C. Thron, "The 'Multi-armed Bandit' Problem and Optimality of the 'Gittins Index' Strategy’“ in Topics in Modern Probability (J.L. Snell, ed., CRC Press, 1995), pp. 321-354.

## U.S. PATENTS

*Granted:*

Chengke Sheng, Christopher Thron, “Techniques for Frequency-Domain Joint Detection in Wireless Communication Systems,” U.S. Patent #8169972 B2, May 1, 2012.

Dipesh Koirala, Christopher Thron, “Efficient Fixed-Point Real-Time Thresholding for Signal Processing,” U.S. Patent #7936921, May 3, 2011.

David B. Kramer, Chris P. Thron, Bernard Karl Gunther, "System and Method for Implementing ACLs Using Standard LPM Engine, U.S. Patent #7861291, December 28, 2010.

Andrew M. Khan, Christopher P. Thron, Curtis M. Williams, George F. Opas, "Method and apparatus for Predistortion Training in an Amplifier Utilizing Predistortion.", U.S. Patent #7251464, Jul 31, 2007.

Chris Thron, Chengke Sheng, and Leon Turner, "Method and apparatus for determining whether a received signal includes a desired signal," U.S. Patent #7035319, April 25, 2006.

Chris Thron, Dipesh Koirala, and Dana Taipale, "Method And Apparatus For Determining An Upper Data Rate For A Variable Data Rate Signal," U.S. Patent #7006439, Feb. 28 2006.

Chengke Sheng, Christopher Thron, T. Keith Blankenship, "Method and apparatus for coherent detection in a telecommunications system," U.S. Patent #6,839,381, January 4, 2005.

Christopher Thron, Keith Blankenship and Michael Thomas, "Extended base band multicarrier system," U.S. Patent #6,477,477, November 5, 2002.

Chris Thron, Michael Thomas, David Anderson, "Digital Predistortion for Power Amplifiers," U.S. Patent #6,304,140, October 16, 2001.

*Published Applications:*

Thron, Chris P., Gunther, Bernard Karl, Kramer, David B., "System and method for implementing ACLs using multiple hash-trie-key tables", U.S. Patent Application #20070201458, August 30 2007.

OTHER PUBLICATIONS:

C. Thron, "Flaws, Fallacies, and Flimflam: What's $100 in three years worth to me now?", College Mathematics Journal, September 2011.

C. Thron, "As Easy as 1-2-3," ('The Playground' feature), Math Horizons, April 2010.

K. Enosawa, D. Haruki, C. Thron, "Normalized Least Mean Square for a Smart Antenna System," Freescale Semiconductor Application Note AN3351, March 2006.

C. Thron, "God's Communication Design in the Bible," Quodlibet Journal 4 (4) (http://www.quodlibet.net/articles/thron-communication.shtml), November 2002 (ISSN: 1526-6575).

C. Thron, "Biblical Faith and the Mindset of the Physicist," Quodlibet Journal 3 (1) (http://www.quodlibet.net/articles/thron-physics.shtml), Winter 2001 (ISSN: 1526-6575).

"An Unpleasant Task'" The Upper Room Devotional Magazine, March 29 2002.

"Inside Out and Upside Down'" The Upper Room Devotional Magazine, February 16 2001.

"Belief in the Unseen'" The Upper Room Devotional Magazine, February 5 1999.

VIDEO SERIES:

Thron, Chris. "Algebraic Structures and Applications." YouTube. YouTube, n.d. Web. 26 Apr. 2015. <https://www.youtube.com/playlist?list=PL2uooHqQ6T7PW5na4EX8rQX2WvBBdM8Qo>.

Thron, Chris. "Jim Hefferon Linear Algebra." (video series to accompany Jim Hefferon's "Linear

Algebra"). YouTube. YouTube, n.d. Web. 26 Apr. 2015. <https://www.youtube.com/playlist?list=PL2uooHqQ6T7MQvZ1kP-NnB2rn-TA4rK5w>.

Thron, Chris. "Rob Beezer Linear Algebra." (video series to accompany Rob Beezer's "Linear Algebra"). YouTube. YouTube, n.d. Web. 26 Apr. 2015. <https://www.youtube.com/playlist?list=PL2uooHqQ6T7P68qS0QDlj613LsqCoX-2H>,

Thron, Chris. "Numerical Analysis Spreadsheet Exercises (English)." (video series to accompany Autar Kaw's "Numerical Analysis"). YouTube. YouTube, n.d. Web. 26 Apr. 2015. <https://www.youtube.com/playlist?list=PL2uooHqQ6T7PAAIOcJFP50cXGb-hA3-31>.

Thron, Chris. "Analyse Numerique: Feuilles de Calcul." (video series to accompany Autar Kaw's "Numerical Analysis" (in French)). YouTube. YouTube, n.d. Web. 26 Apr. 2015. <https://www.youtube.com/playlist?list=PL2uooHqQ6T7MeoqspWVh_1YglBFOWys-B>.

## CONFERENCE PAPERS AND WORKSHOPS

C. Thron and R. McCoy, "Modeling and Simulation of Sectarian Tensions in Split Communities", 2016 International Conference on Social Computing, Behavioral-Cultural Modeling & Prediction and Behavior Representation in Modeling and Simulation (SBP-BRiMS), June 29-July 1, 2016.

C. Thron, "Rising prosperity, declining well-being: a mathematical model." IBII International Conference on Mathematics and Applications (ICMA '16), April 28-30, 2016.

H. Smith and C. Thron, "Indefinite integration via discrete Fourier transform, with epidemiological applications." IBII International Conference on Mathematics and Applications (ICMA '16), April 28-30, 2016.

J. Barry and C. Thron, "A Physics-based Model for Target Coverage." IBII International Conference on Mathematics and Applications (ICMA '16), April 28-30, 2016.

C. Thron, "Mathematics and Clear Thinking about Social Policy," (Invited address) Third International Conference on Mathematical Analysis and Optimization: Theory and Applications," University of Lagos, Lagos Nigeria, March 23-25, 2015.

C. Thron, "A hands-on introduction to Octave/Matlab" (workshop). University of Lagos, Lagos Nigeria, March 7-9, 2016.

C. Thron and A. Aziz, "Algebraic Solution for Beamforming in Two-Way Relay Systems with Analog Network Coding," 15th IEEE International Symposium on Signal Processing and Information Technology, Abu Dhabi UAE (December 2015).

J. I. Fendji, C. Thron, J. M. Nlong, K.-H. Roediger, "Simulated Annealing approach for mesh router placement in rural Wireless Mesh Networks," 7th EAI International Conference on e-Infrastructure and e-Services for Developing Countries (AFRICOMM 2015), Cotonou, Benin (December 2015).

C. Thron. "Quantum Mechanics as the Outcome of an Accumulative Statistical Process," Fall 2015 Joint Meeting of the Texas Section of the AAPT, Texas Section of the APS and Zone 13 of the Society of Physics Students, Waco TX (October 2015).

M. DeKock, E. Frederick, D. Seymore, C. Thron, J. Watts, "Use regular expressions in R to convert unstructured customer data to a standard format", Texas Section, Mathematical Association of America, April 9-11 2015.

C. Thron, "Optimization problems and simulation in signal processing and biological control"

and “Mathematicians out of the Box.” (Invited addresses) Second International Conference on Mathematical Analysis and Optimization: Theory and Applications,” University of Lagos, Lagos Nigeria, March 23-25, 2015.

C. Thron, “Introduction to Mathematical Software” (workshop). University of Lagos, Lagos Nigeria, March 17-18, 2015.

D. Fotsa Mbogne, C. Thron, “Optimal control of coffee-berry disease using both chemical and cultivational methods,” AMS-MAA Joint Mathematics Meetings, San Antonio TX (January 10-13, 2015).

C. Thron, “Addressing social scientists’ misconceptions about hypothesis testing,” AMS-MAA Joint Mathematics Meetings, San Antonio TX (January 10-13, 2015).

C. Thron, “Increasing prosperity, decreasing satisfaction: insights from an agent-based model,” AMS-MAA Joint Mathematics Meetings, San Antonio TX (January 10-13, 2015).

C. Thron, J.Hill, “Algebraic structures with applications: abstract algebra courseware for non-abstract thinkers,” AMS-MAA Joint Mathematics Meetings, San Antonio TX (January 10-13, 2015).

J. I. Fendji, C. Thron, J. M. Nlong, K.-H. Roediger, “Mesh Router Nodes placement in Rural Wireless Mesh Networks,” 12ème édition du Colloque Africain sur la Recherche en Informatique et en Mathématiques Appliquées, Senegal (October 2014).

C. Thron, “Beamforming Problems in Wireless Communications” (short course), and “Simple agent-based Models of Social Systems,” 4th Annual Workshop on Cryptography, Algebra, and Geometry, University of Dschang, Dschang Cameroon (July 2014).

C. Thron, “Frogs in a Pot”: an Agent-Based Model of Well-Being Versus Prosperity,” 2014 International Conference on Social Computing, Behavioral-Cultural Modeling, & Prediction, Washington DC, April 1-4 2014.

C. Thron, “Relay Robust Beamforming in 2-way Relay Systems: An application of mathematical optimization to wireless communication,” and “Simple Optimization Techniques for Practical Problems,” International Conference on Mathematical Analysis and Optimization: Theory and Applications,” Lagos Nigeria, March 12-14 2014.

C. Thron, “Mathematical Education of Masters-level Engineers in Cameroon: Perspectives and Possibilities” and “Mathematical Modeling in Social Sciences,” 3rd Annual Workshop on Cryptography, Algebra, and Geometry, University of N'Gaoundéré, N'Gaoundéré Cameroon (December 2013).

Chris Thron, “A Process Interpretation of the Feynman Integral,” Texas A&M University Physics of Quantum Electronics Follow-on Workshop, January 2013.

Chris Thron, Elizabeth Jackson, “Practicality of Agent-based Modeling of Civil Violence: an Assessment,” International Organization of Social Science and Behavioral Research (Biloxi MS October 2012).

Elizabeth Jackson, Chris Thron, “Patterns of Leftist, Rightist, and Cartel violence in Colombia 1989-1998,” International Organization of Social Science and Behavioral Research (Biloxi MS October 2012).

Chris Thron, Johnny Watts, “A Signal Processing Model of Quantum Mechanics,” Baylor University Department of Physics Colloquium, October 2012.

Chris Thron, John Salerno, Adam Kwiat, Philip Dexter, Jason Smith, “Modeling South African Service Protests using the National Operational Environment Model”, 2012 International Conference on Social Computing, Behavioral-Cultural Modeling, & Prediction, (College Park, MD April 2012).

John J. Salerno, Warren Geiler, Brian Hudson, Brian Roman, Jason Smith, Christopher Thron, "The National Operational Environment Model, A Focus on Understanding the Populace" MODSIM 2011 (Virginia Beach, VA October 2011).

"Student Mathematical Modeling Projects with Interactive Spreadsheets," MAA Mathfest (Lexington, KY, August 2011)

(with Justin Hill) "An Abstract Algebra Class for Secondary Mathematics Teachers," MAA Mathfest (Lexington, KY August 2011)

"Voila!" Proofs with Iteratively Inscribed Triangles," MAA Mathfest (Lexington, KY, August 2011)

"Current and Future Opportunities in Wireless Communications" and "Open Source Overview and Opportunities'" International Colloquium on Mathematics, Science, and Society (Porto Novo, Benin January 2004)

"Advanced Technologies for 3G Base Stations'" Smart Networks Developers' Forum (Dallas, TX, 2003).

"Smart Antennas, 3G Base Station Theory, and Implementation'" Communications Design Conference (San Jose, CA, 2002).

"Smart Antennas for 3G & Implementation on StarCore SC140 Devices'" Smart Networks Developers' Forum (New Orleans, LA, 2002).

"Wideband CDMA (Code Division Multiple Access) Physical Layer and Chip Rate Processing Tutorial'" Smart Networks Developers' Forum (New Orleans, LA, 2001).

"The PZ method for estimating determinant ratios, with applications'" 13th International Symposium on Lattice Field Theory (St. Louis, MO, 1996).

"Taylor series expansions for eigenvalues and eigenfunctions of parametrized composition operators'" 100th Annual Meeting of the American Mathematical Society (Cincinnati, OH, 1994).

"Efficient methods for Monte Carlo inversion of quark matrices'" 11th International Symposium on Lattice Field Theory (Dallas, TX, 1994).

"God is Light, Sin is Entropy: Physical Analogies for Biblical Concepts'" Fifth Interdisciplinary Conference on Science, Technology and Religious Ideas (Kentucky State University, Frankfort, KY, 1994).

## GRANTS AND FELLOWSHIPS

Air Force Summer Faculty Fellowship, Air Force Research Laboratory, Rome NY (June-Aug 2016) Wireless propagation modelsx` (Principal Investigator: Douglas Smith).

International Mathematical Union, Commission on Developing Countries, Volunteer Lecturer Program, March-April 2016. Taught two 3-week classes at the University of N'Gaoundéré ENSAI (Cameroon) to masters-level students: one in numerical analysis and one in applied statistics. Taught a 1-credit class in mathematical software (Octave/Matlab) at the University of Ilorin (Nigeria).

International Mathematical Union, Commission on Developing Countries, Volunteer Lecturer Program, March-April 2015. Taught two 3-week classes to masters-level students: one in numerical analysis and one in applied statistics at the University of N'Gaoundéré ENSAI, Cameroon.

Fulbright Faculty Fellowship, Institut Supérieur du Sahel (Maroua Cameroon) and University of N'Gaoundéré ENSAI (Cameroon), February 2013 –January 2014. Teaching and research in

mathematical modeling applied to Sahel resource management and development.

Air Force Summer Faculty Fellowship, Air Force Research Laboratory, Rome NY (May-Aug 2012) Agent-based behavior models of large-scale populations (Principal Investigator: John Salerno).

Air Force Research Laboratory Extension Grant to work on National Operational Environment Model (NOEM) (Principal Investigator: John Salerno). $10K for August-December 2011; $15K for January – May 2011.

Air Force Summer Faculty Fellowship, Air Force Research Laboratory, Rome NY (June 11 – Aug 11) Agent-based behavior models of large-scale populations (Principal Investigator: John Salerno).

Fulbright Faculty Fellowship, University of N'Djamena Department of Mathematics, Chad Africa (Jan 04 – May 04).

U.S. Department of Energy Quality Achievement Award, 1993-1995. Merit award from DOE helped to support graduate study.

Pew Fellow, University of Kentucky, Lexington, KY, summer 1992: worked with physics professor K.F. Liu on stochastic and semi-stochastic inversion of large matrices in lattice quantum chromodynamics.

Participant, NSF CHANCE project in statistics education, 1991-1992: in collaboration with faculty at several universities, designed and implemented an undergraduate course in statistics based on current events.

## OTHER SCHOLARLY ACTIVITIES

Judge for student presentations, Fall 2015 Meeting of the Society of Physics Students (Zone 13): Evaluated and wrote reviews of 4 student presentations.

Reviewer for Fulbright fellowship program for west central Africa, October 2015 (screened U.S. applicants for Fulbright visiting scholar appointments in countries in west central Africa.

Paper reviewer: 15th IEEE International Symposium on Signal Processing and Information Technology (ISSPIT 2015) (3 papers); Journal of Social Sciences Research (1 paper); Journal of AIDS and HIV Research (1 paper); International Journal of Mathematical Analysis and Optimization: Theory and Applications (1 paper)

## EDUCATION

University of Kentucky, Lexington Ph.D. in Physics (Computational Physics)

University of Wisconsin, Madison Ph.D. in Mathematics (Probability)

Princeton University BA Magna cum Laude in Mathematics

## CERTIFICATIONS

SOA/CAS (Actuarial) Exam P (February 2008)

## OTHER

Institute for Children's Literature, "Writing for Children and Teenagers"