

## Christopher Thron

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### OBJECTIVE

To promote, contribute to and engage in mathematically sound, computationally efficient and technologically advanced research that is targeted towards improving quality of life, particularly in underdeveloped and underprivileged populations.

### SUMMARY

**Research:** Algorithm design and mathematical modeling for applications in various fields including data science in health, disease modeling, operations research, sensor networks, and wireless communication. Proven innovator with nine patents granted. Strong verbal and written communication skills, with numerous publications in refereed journals & presentations at professional conferences.

**Teaching:** Founding member of Texas A&M University-Central Texas mathematics department. As Master's program coordinator, played a key role in launching an online Master's program. Supervised undergraduate and graduate student research (including 8 completed + 3 current Master's theses), resulting in several publications and conference presentations. Currently mentoring 2 Ph.D. students in Africa. Developed and promoted progressive instructional methods in computational mathematics and statistics in five African universities. Development of online, open-source instructional materials, including textbooks (with video playlists) and software tutorials.

**Expertise includes:**

Subject areas: computational mathematics, algorithm design, mathematical modeling and simulation, optimization, wireless communications, statistics,

Programming: Python, R, MATLAB/Octave, Scilab, LaTeX, Sage, Mathematica

Languages: French & Chinese

### ACADEMIC POSITIONS

TEXAS A&M UNIVERSITY CENTRAL TEXAS, Killeen TX Fall 2009–Present  
Associate Professor of Mathematics (tenured August 2015) and former chairman of the  
Department of Science and Mathematics (September 2014-December 2018)

FULBRIGHT VISITING PROFESSOR 2004-5, 2013-14, 2018-19

Professor of Mathematics/Statistics/Computer Science: African University of Science and  
Technology, Nigeria (6/19-10/19); Alzaeim Alazhari University, Sudan (12/18-4/19);  
University of Maroua, Cameroon (02/13-08/13); University of N'Gaoundéré, Cameroon

(08/13-01/14); University of N'Djamena (01/04-05/04).

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

MINISTRY OF EDUCATION, People's Republic of China 1985-1990  
Foreign Expert in English and Mathematics

### **INDUSTRY EXPERIENCE**

APPLIED MATHEMATICS, INC., Gales Ferry, Connecticut 1991-present  
Mathematician/Consultant (contract, per-project basis)

FREESCALE SEMICONDUCTOR, Austin TX 1997-2009  
Senior systems engineer (1997-2007); Information Developer (Network and Multimedia Group)  
(2008-09)

NEC AMERICA, INC., Irving, TX 1995-1997  
Senior systems engineer

### **REFEREED JOURNAL ARTICLES**

Njoya, A.N., Thron C., Awa M.N., Ari A.A.A., Gueroui, A.M., (2022), Power-saving system designs for hexagonal cell based wireless sensor networks with directional transmission, *Journal of King Saud University - Computer and Information Sciences*, ISSN 1319-1578, <https://doi.org/10.1016/j.jksuci.2022.07.008>.

Subair S, Yosif D, Ahmed A, Thron C. (2022) Cyber Crime Forensics. *International Journal of Emerging Multidisciplinaries: Computer Science & Artificial Intelligence*. 2022 May 30;1(1):41-9.

Njoya AN, Thron C, Awa MN, Ari AA, Gueroui AM. (2022) Lifetime optimization of dense wireless sensor networks using continuous ring-sector model. *Future Generation Computer Systems*. 129:212-24.

Tamayo LV, Mbazumutima V, Thron C, Todjihounde L.(2021), "Three-Stage Numerical Solution for Optimal Control of COVID-19". *Mathematics (MDPI)*. 9(15):1777.

Thron, C., Mbazumutima, V., Tamayo, L.V. et al. (2021), "Cost effective reproduction number based strategies for reducing deaths from COVID-19". *J.Math.Industry* 11, 11. <https://doi.org/10.1186/s13362-021-00107-6>.

Hussein EA, Ghaziasgar M, Thron C, Vaccari M, Bagula A. (2021), "Basic Statistical Estimation Outperforms Machine Learning in Monthly Prediction of Seasonal Climatic Parameters". *Atmosphere*. 12(5):539.

Hamid, M.; Thron, C.; Fageeri, S. (2021), "Demographics of Sudanese University Students in

- Relation to Regional Conflict and Underdevelopment". *Soc. Sci.* 10, 89.  
<https://doi.org/10.3390/socsci10030089>
- Thron, C., & Smith, K. (2021). Pollution-Development Tradeoffs in Nigeria: An Agent-based Model. *International Journal of Mathematical Sciences and Optimization: Theory and Applications*, 7(1), 43 - 58. <https://doi.org/10.6084/m9.figshare.14741295>.
- Hussein E., Thron C., Ghaziasgar M., Bagula A, and Vaccari M. (2020), "Groundwater Prediction Using Machine-Learning Tools". *Algorithms* 1 (5) (Impact factor 1.5)
- Hamid, M., Thron. C, Fageeri, S. (2020), "Status and Trends in University Education for Women in Sudan: a Graphical Data Analysis". *Social Science and Humanities Open* 2 (1), ISSN 2590-2911.
- Vargas Tamayo, L., Thron, C., Fendji, J. L. K. E., Thomas, S. K., & Förster, A. (2020). Cost-Minimizing System Design for Surveillance of Large, Inaccessible Agricultural Areas Using Drones of Limited Range. *Sustainability*, 12(21), 8878.(2019 Impact factor: 2.576)
- Fendji JL, Bayaola IK, Thron C, Fendji MD, Förster A. (2020). Cost-Effective Placement of Recharging Stations in Drone Path Planning for Surveillance Missions on Large Farms. *Symmetry*. Oct;12(10):1661.(2019 Impact factor: 2.645)
- Thron, Christopher, and Jordan Barry (2020). "A Visualizable, Constructive Proof of the Fundamental Theorem of Algebra, and a Parallel Polynomial Root Estimation Algorithm". *International Journal of Mathematical Sciences and Optimization* 1, 757 -63.
- Fendji, L., and Thron, C. (2020), "A Simulated Annealing Based Centre of Mass (SAC) Approach for Mesh Routers Placement in Rural Areas". *International Journal of Operations Research and Information Systems* 11(1).
- Mbatumutima V, Thron C, Todjihounde L. (2019), Enumerative numerical solution for optimal control using treatment and vaccination for an SIS epidemic model. *BIOMATH* 8(2):1912137.
- J. C. Kamgang, C. P. Thron (2019), "Analysis of Malaria Control Measures' Effectiveness Using Multistage Vector Model". *Bulletin of Mathematical Biology*. 81(11), p. 4366-4411.
- Thron, C., & Hernandez, N. (2019) "Statistics Gone on Holiday: Misinterpretations of Hypothesis Tests Propagated by Internet Resources", *Journal of Social Sciences and Humanities (Public Science Framework)*, Vol.5, No.3.
- Adewara, J. A., Adeyeye, J. S., & Thron, C. P. (2019). Properties and Applications of the Gompertz Distribution. *International Journal of Mathematical Sciences and Optimization: Theory and Applications*, 2019(1), 443 - 454.
- A. Mounqache, B. Bayard, A. Tahir, C. Thron, S. Robert, F. Gambou (2019), "Calibration of a Three-Detector Microwave Ellipsometer", *International Journal of Current Research* 10(12): 76305-76312.
- C. Thron (2018), "Building Pythonic Pyramids in Nigeria". *Mathematical Association of America (MAA) Focus Magazine*, August-Sep 2018.
- O.J. Awoloye, T. Harris-Jackson, N. Hernandez, C. Thron, R. Olukolade (2017), "Stress, Health,

- and Accident Risks for Commercial Drivers in Abuja, Nigeria: Causes and Correlations". The Nigerian Health Journal Vol. 17(2) 1-16.
- Njoya, A. N., Thron, C., Barry, J., Abdou, W., Tonye, E., Konje, N. S. L., & Dipanda, A. (2017). Efficient scalable sensor node placement algorithm for fixed target coverage applications of wireless sensor networks. *IET Wireless Sensor Systems*, 7(2), 44-54.
- Thron, C. (2016). Lifestyle Tradeoffs and the Decline of Societal Well-Being: An Agent-Based Model. *Journal of Artificial Societies and Social Simulation*, 19(2), 1-5.
- O. J. Awoloye and C. Thron (2016), "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>.
- O. J. Awoloye and C. Thron (2015), "Determinants of Human Immunodeficiency Virus (HIV) Infection in Nigeria: A Synthesis of the Literature," *Journal of AIDS and HIV Research* 7(9).
- C. Thron (2015), "An Accumulative Model for Quantum Theories", *Electronic Journal of Theoretical Physics* Vol. 12(33).
- D. Fotsa, C. Thron (2015), "Optimal Control of Anthracnose Using Mixed Strategies," *Mathematical Biosciences* 269: 186-198.
- C. Thron, V. Miller (2015), "Persistent Confusions about Hypothesis Testing in the Social Sciences," *Social Sciences* Vol. 4(2): 361-372.
- C. Thron, A. Aziz (2015), "Very Low Complexity Algorithms for Beamforming in Two-Way Relay Systems," *Imhotep: African Journal of Pure and Applied Mathematics* Vol.2(1): 13-24.
- J.-L. Fendji, C. Thron, J. M. Nlong (2015), "A Metropolis Approach for Mesh Router Nodes placement in Rural Wireless Mesh Networks," *Journal of Computers* Vol.10(2): 101-114.
- D. Fotsa, E. Houpa, D. Bekolle, C. Thron, M. Ndoumbe (2014), "Mathematical modelling and optimal control of anthracnose," *Biomath* 3, pp. 1-16.
- A. Aziz, C. Thron, S. Cui, C. Georghiades (2014), "Linearized Robust Beamforming for Two-Way Relay Systems," *IEEE Signal Processing Letters*, 21(8), 1017-1021.
- C. Thron, J. Watts (2013), "A Signal Processing Model of Quantum Mechanics," *African Review of Physics*, vol. 8.
- J. Moten, C. Thron (2013), "Improvements on Secant Method for Estimating Internal Rate of Return (IRR)," *International Journal of Applied Mathematics and Statistics*, 42, 12.
- C. Thron (2010), "Beyond Regression: Line Fitting Algorithms for Exceptional Cases (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 (2004), "Fast, Accurate Math Functions on Parallel Devices". *Embedded.com* (<http://www.embedded.com/showArticle.jhtml?articleID=47901094>), September 22, 2004.
- Runton D, Zavosh F, Thron C. "Gauge the Impact of Modulator Compensation on CDMA

- Performance". *Wireless Systems Design*. 2000;5(7):33-7.
- Zavosh F, Runton D, Thron C. "Digital Predistortion Linearizes COMA LDMOS Amps." *Microwaves & RF*. 2000 Mar 1;39(3):55-+.
- Zavosh F, Thomas M, Thron C, Hall T, Artusi D, Anderson D, Ngo D, Runton D. Digital Predistortion Techniques for RF Power Amplifiers with CDMA Applications. *Microwave Journal*. 1999 Oct 1;42(10):12.
- C. Thron, S.J. Dong, K.F. Liu, and H.P. Ying (1998), "Padé-Z2 Estimator of Determinants". *Physical Review D* 57, 3 1642.
- C. Thron, K.F. Liu, and S.J. Dong (1997), "The PZ Method for Estimating Determinant Ratios, with Applications". *Nuclear Physics B (Proc. Suppl.)* 53, 977-979.
- S. Bernardson, P. McCarty, and C. Thron (1994), "Efficient Methods for Monte Carlo Inversion of Quark Matrices". *Nuclear Physics B (Proc. Suppl.)* 34, 759-761.
- S. Bernardson, P. McCarty, and C. Thron (1994), "Monte Carlo Methods for Estimating Linear Combinations of Inverse Matrix Entries in Lattice Q.C.D." *Computer Physics Communications* 78, 256-64.
- C. Thron (1994), "Taylor Series Expansions for Eigenvalues and Eigenfunctions of Parametrized Composition Operators". *Journal of Mathematical Physics* 35, 2024-35.
- C. Thron (1991), "Taylor Series Expansion of the Dominating Eigenvalue of the Ruelle-Araki Transfer Operator". *Journal of Mathematical Physics* 32 (10).

### **BOOKS / BOOK CHAPTERS**

- M. Alloghani, C. Thron, and S. Subair (eds), "Artificial Intelligence: Theoretical and Practical Approaches", Springer (2022). (co-authored 4 chapters)
- S. Subair and C. Thron (eds), "Implementations and Applications of Machine Learning", Springer (June 2020). (co-authored 8 chapters)
- J. Hill, C. Thron et al. "Elementary Abstract Algebra: Examples and Applications," American Institute of Mathematics, 2017. (Online publication: <http://sl2x.aimath.org/book/aafmt/>)
- J. Barry, C. Thron, "A Computational Physics-based Algorithm for Target Coverage Problems", in "Advances in Nature-Inspired Computing and Applications" (S.K. Shandilya, S. Shandilya, A.K. Nagar, eds.), Springer (November 2018).
- W. Wilcox, C. Thron, "Advanced Electrodynamics, an Introductory Graduate Treatment," World Scientific, January 2016.
- 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.

### **PEER REVIEWED CONFERENCE PROCEEDINGS**

- Fendji, J. L. E. K., Kongne, R. N., Thron, C., Yenke, B. O., Ngakou, A., & Kamgang, J. C. (2020). Improving farmers' net revenue in traditional context: Analytic Hierarchy Process, Expert System, and Linear Programming". EAI Endorsed Trans. Context-aware Syst.& Appl., 7(20), e2.
- C. Thron, K. Tran, D. Smith, D. Benincasa (2017), "Design and Simulation of Sensor Networks for Tracking Wifi Users in Outdoor Urban Environments". Proc. SPIE 10206, Disruptive Technologies in Sensors and Sensor Systems.
- C. Thron and R. McCoy, "Modeling and Simulation of Sectarian Tensions in Split Communities", in Xu et. al. (Eds.). Social Computing, Behavioral–Cultural Modeling, and Prediction (9th International Conference Proceedings), Springer, 2016.
- C. Thron and A. Aziz (2015), " 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).
- Fendji, J.L. E. K., Thron, C., & Nlong, J.M. (2014), "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, "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.
- C. Thron, E. Jackson (2013), "Practicality of Agent-Based Modeling of Civil Violence: an Assessment," IOSSBR Journal of Social Sciences Research, vol. 2.
- 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.

### **U.S. PATENTS**

- 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.

#### **CONFERENCE PRESENTATIONS AND SEMINARS**

- C. Thron, “A non-causal reconceptualization of quantum field theory”, 43<sup>rd</sup> meeting of the Alternative Natural Philosophy Association, Liverpool UK August 10 2022.
- C. Thron, “Mathematics of Natural Language Processing”, KMER AI conference on Artificial Intelligence and Machine Learning with its Applications, University of Buea, Cameroon (and online), April 30 2022.
- C. Thron, “Practices, Potentials, and Pitfalls of Machine Learning”, International Conference of Engineering Science and Development (invited address), University of Dschang, Cameroon (Online), March 16 2022.
- C. Thron, “Potentials and Pitfalls of Machine Learning”, International Conference on Innovations, Research and Challenges in Emerging Technologies (keynote address), Panipat Institute of Engineering and Technology, Panipat India (online), November 19, 2021.
- C. Thron, “Best Practices for Machine Learning in Developing Countries”, Indaba X online conference, Dschang Cameroon, November 17, 2021.
- C. Thron, “Building the Second Tier of African University Faculty”, 2021 Fulbright Association Annual Conference (virtual), October 22 2021.
- C. Thron, “Potentials and Pitfalls of Machine Learning”, University of Nizwa College of Economics, Management & Information Systems seminar (online), October 13, 2021.
- C. Thron, “Do’s and Don’ts of Machine Learning for Developing Countries”, First International Conference on Artificial Intelligence and Robotics (University of Lagos, online), September 21, 2021.
- C. Thron, “Mathematics of Machine Learning”, Institute for Mathematics and Physical Sciences, University of Abomey-Calavi (Benin), August 1 2021.

- C. Thron, "Data Visualization for Categorical Variables Using R", Department of Mathematics, University of Lagos, Nigeria (online), June 16 2021.
- C. Thron, "Optimizing Mathematics in Nigeria" (plenary talk) and "Machine Learning and Prediction of Sequential Images", 7<sup>th</sup> Annual International Conference on Mathematical Sciences and Optimization, Lagos Nigeria (online), Nov. 24-Dec 2, 2020.
- C. Thron, "Optimal management of COVID-19 using a combination of distancing & testing strategies" (invited talk). Annual Conference of the Institute of Operational Research and Management Science of Nigeria (IORMS), online, November 18, 2020.
- JLJK Ebongue, C Thron, A Förster "A Multi-objective Approach for Wireless Heterogeneous Router Placement in Rural Wireless Mesh Networks". 12<sup>th</sup> International Conference on e-Infrastructure and e-Services for Developing Countries (AFRICOMM) November 2020,
- JLJK Ebongue, I Bayaola, C Thron, A Förster "Charging Stations placement in Drone Path planning for large space surveillance". Colloque Africain sur la Recherche en Informatique et en Mathématiques Appliquées (CARI), October 2020.
- Hussein, E., Ghaziasgar, M., & Thron, C. (2020, July). Regional Rainfall Prediction Using Support Vector Machine Classification of Large-Scale Precipitation Maps. In 2020 IEEE 23rd International Conference on Information Fusion (FUSION) (pp. 1-8). IEEE.
- C. Thron, "A Statistical 'My Dear Watson'", Faculty Senate Summit, Texas A&M University-Central Texas, Killeen TX, 17 April 2020.
- C. Thron, "Educational Challenges in an Era of Information Explosion" (plenary talk), 7<sup>th</sup> International Conference on Computer Sciences and IT (SCCSIT), International University of Africa, Khartoum, Sudan, Jan. 7-9 2020.
- C. Thron, "Dynamic Programming: Concepts and Applications" (invited talk). Annual Conference of the Institute of Operational Research and Management Science of Nigeria (IORMS), Mountain Top University, Nigeria, July 22-26, 2019.
- C. Thron, "A Path Integral-Based Physical Model for Causality and the Born Rule". Physics Department Seminar, African University of Science and Technology, Abuja Nigeria,, June 27 2019.
- K. Tran and C. Thron, "Fourier Subspace Preserving Particle Filter (poster paper)", 22nd International Conference on Information Fusion (Fusion 2019), Ottawa Canada, July 2-5 2019.
- C. Thron, "Mathematics that Matters (High-Impact Mathematics)", plenary address at the 6<sup>th</sup> International Conference on Mathematical Analysis and Optimization, Theory and Applications (ICAPTA). Abuja, Nigeria, March 28 2019.
- C. Thron, "A Medical Performance Monitoring Algorithm: the Life Story of a Research Idea", 6<sup>th</sup> Computer Science and Information Technology Conference, Alzaiem Alazhari University, Khartoum Sudan December 15-16 2018.
- V. Mbazumutima, C. Thron, L. Todjihounde, "Techniques for Optimal Control of Multicompartment Models", plenary address at the International Conference on Mathematical



- Modeling of Environmental Pollution, National Mathematical Center, Abuja Nigeria, 2-6 December 2018.
- K. Smith and C. Thron, “Market Focus and Excessive Social Drift: an Agent-Based Model”, plenary address at the International Conference on Mathematical Modeling of Environmental Pollution, National Mathematical Center, Abuja Nigeria, 2-6 December 2018.
- T. Laver and C. Thron, “Budget Prediction and Reconciliation through Dynamic Programming (poster)”, Military Operations Research Society Emerging Technologies Forum, Alexandria VA December 3-5 2018.
- J. Sossamon and C. Thron, “Medical Performance Monitoring Using a Log Likelihood Statistic (poster)”, Military Operations Research Society Emerging Technologies Forum, Alexandria VA December 3-5 2018.
- J. Sossamon and C. Thron, “Surgical Performance Monitoring Using an Maximum Likelihood Statistic”, Texas Women In Mathematics Symposium, University of Houston, November 17-18 2018.
- K. Weis and C. “Market Focus and Excessive Social Drift: an Agent-Based Model (poster)”, Texas Women In Mathematics Symposium, University of Houston, November 17-18 2018.
- C. Thron, “Machine Learning, Applications and Implementations”. (Invited address) Sixth International Conference on Mathematical Analysis and Optimization: Theory and Applications,” University of Lagos, Lagos Nigeria, March 14, 2018.
- L. Brandt and C. Thron, “Modeling Expenses and Liabilities in an Army Accounting System”, Mathfest 2017 (Mathematical Association of America), 28 July 2017, Chicago IL USA
- N. Hernandez and C. Thron, “Type I Error: Conditional or Unconditional?”, Mathfest 2017 (Mathematical Association of America), 29 July 2017, Chicago IL USA.
- C. Thron, K. Tran, D. Smith, D. Benincasa, “Design and simulation of sensor networks for tracking Wifi users in outdoor urban environments”. SPIE Defense and Commercial Sensing, 9-13 April 2017, Anaheim CA USA.
- C. Thron, “Time as a Dynamical Variable”, American Physical Society 2017 April Meeting, 27-31 Jan 2017, Washington DC USA.
- J. Ebongue and C. Thron, “Centre of Mass of single coverage: A comparative study with Simulated Annealing for mesh router placement in rural regions”, 13th African Conference on Research in Computer Science and Applied Mathematics, Tunis, Tunisia, October 2016.
- 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 and A. Aziz, "Algebraic Solution for Beamforming in Two-Way Relay Systems with Analog Network Coding," 15<sup>th</sup> IEEE International Symposium on Signal Processing and Information Technology, Abu Dhabi UAE (December 2015).
- J. Ebongue, 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, JLagos Nigeria, March 23-25, 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 Node Placement in Rural Wireless Mesh Networks," 12<sup>ème</sup> édition du Colloque Africain sur la Recherche en Informatique et en Mathématiques Appliquées, Sénégal (October 2014).
- C. Thron, "Beamforming Problems in Wireless Communications" (short course), and "Simple agent-based Models of Social Systems," 4<sup>th</sup> Annual Workshop on Cryptography, Algebra, and Geometry, University of Dschang, Dschang Cameroon (July 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 Master's-level Engineers in Cameroon: Perspectives and Possibilities" and "Mathematical Modeling in Social Sciences," 3<sup>rd</sup> 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.
- 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).
- C. Thron, "Student Mathematical Modeling Projects with Interactive Spreadsheets," Mathfest 2011 (Mathematical Association of America), Lexington, KY, August 2011.
- Justin Hill, Chris Thron "An Abstract Algebra Class for Secondary Mathematics Teachers," Mathfest 2011 (Mathematical Association of America), Lexington, KY August 2011.
- "Voila!" Proofs with Iteratively Inscribed Triangles," Mathfest 2011 (Mathematical Association of America), 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)
- C. Thron, "Advanced Technologies for 3G Base Stations", Smart Networks Developers' Forum (Dallas, TX, 2003).
- C. Thron, "Smart Antennas, 3G Base Station Theory, and Implementation", Communications Design Conference (San Jose, CA, 2002).
- C. Thron, "Smart Antennas for 3G & Implementation on StarCore SC140 Devices", Smart Networks Developers' Forum (New Orleans, LA, 2002).
- C. Thron, "Wideband CDMA (Code Division Multiple Access) Physical Layer and Chip Rate

- Processing Tutorial”, Smart Networks Developers’ Forum (New Orleans, LA, 2001).
- C. Thron, “The PZ method for estimating determinant ratios, with applications”, 13th International Symposium on Lattice Field Theory (St. Louis, MO, 1996).
- C. Thron, “Taylor series expansions for eigenvalues and eigenfunctions of parametrized composition operators”, 100th Annual Meeting of the American Mathematical Society (Cincinnati, OH, 1994).
- C. Thron, “Efficient methods for Monte Carlo inversion of quark matrices”, 11th International Symposium on Lattice Field Theory (Dallas, TX, 1994).
- C. Thron, "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).

### **SUPERVISED MASTER’S AND PH.D. THESES**

- Gwenda Anderson (M.S., TAMU-CT, expected May 2022): Coordinate Permutation-Invariant Unit  $N$ -Simplexes in  $N$ -dimensional Euclidean Space.
- Eslam Hussein (M.S., University of Western Cape, expected March 2022): Geo-physical Parameter Forecasting on Imagery-based Data Sets using Machine Learning Techniques
- Monira Taj Elsir Hamid Ali (Ph.D., Alzaeim Alazhari University, expected December, 2021) Design of Effective Multidimensional Data Visualization System, for Analysis Sudanese University Admissions Data
- Vianney Mbaizumutima (Ph.D., University of Abomey-Calavi, 2021) Numerical Methods for Optimal Control of Infectious Disease Models
- Luis Vargas Tamayo (M.S. TAMU-CT, 2021) Modeling and Simulation of Cost-Effective Control Strategies for Infectious Diseases
- Delao, Rene A. (M.S. TAMU-CT, 2018), Improved Detection of High Medical Failure Rates
- Lazarus, Jennifer M., (M.S. TAMU-CT, 2018) Algebraic Operations of Polynomials and Polynomial Coding
- Hernandez, Nancy A., (M.S. TAMU-CT, 2017) Development of Health Informatics Education and Practice in Sudan
- Marmolejo, Moses R (M.S. TAMU-CT, 2017), Elliptic Curve Cryptography: Examples and Applications over Galois Field,
- Smith, Hunter D (M.S., TAMU-CT 2017), Numerical Integration of Signals Using the Fast Fourier Transform, Master of Science
- Barry, Jordan (M.S. TAMU-CT, 2016), “A Physics-based Model for Target Coverage”
- Watts, Johnny (M.S. TAMU-CT, 2012) An Accumulation-threshold Model of Quantum

Mechanics

Justin R. Hill. (M.S. TAMU-CT, 2011). Abstract Algebra for Secondary Mathematics Teachers.

## WORKSHOPS

- C. Thron, “Statistics with R”, 9<sup>th</sup> International Conference on Mathematical Science and Optimization (Porto Novo, Benin), June 9-10 2022.
- C. Thron, “Supervised Machine Learning: Classification”, Indaba X online conference, Dschang Cameroon, November 17, 2021.
- C. Thron, “Wireless sensor networks”, and “Disease modeling on networks”, CIMPA School of Mathematical Modeling Approaches for Advancing Conservation, Ecology, and Epidemics (University of Lagos, Nigeria), June 25-27 2021.
- C. Thron, “Statistical Analysis Using R Software”, and “Python for Science and Engineering”, Bowen University (Nigeria) College of Agriculture, Engineering, Science, Mathematics, and Statistics, July 12 2021.
- C. Thron, “Machine Learning Techniques and Optimization”, 8<sup>th</sup> annual International Conference for Mathematical Sciences and Optimization (Nigeria, online) July 6-7, 2021.
- C. Thron, “Epidemiological modeling”, Pan-African Data Science in Health Seminar, (Sudan, online: <https://talkcoast.com/ds-i-africa/>) November 2020
- C. Thron, “Machine Learning and Prediction of Sequential Images”, International Conference for Mathematical Sciences and Optimization (Nigeria, online) November 24-25, 2020.
- C. Thron, “Introduction to Python” and “Introduction to R”, Alzaeim Alazhari University, Khartoum Sudan, Jan 22 and 26 2020.
- C. Thron, “Using Python for Data Science”, 7<sup>th</sup> International Conference on Computer Sciences and IT (SCCSIT), International University of Africa, Khartoum, Sudan, Jan. 7-9 2020.
- C. Thron, “Using Python to solve optimization problems” Annual Conference of the Institute of Operational Research and Management Science of Nigeria (IORMS), Mountain Top University, Nigeria, July 22-26, 2019.
- C. Thron, Workshop in mathematical software, Nigerian Mathematics in Industry Study Group, Covenant University Nigeria September 24-28 2018.
- C. Thron, “Intensive introduction to Python”. Department of Informatics, Yaounde Polytechnic Institute, Yaounde Cameroon July 3-6 2018.
- C. Thron, “Scientific programming with Python” and “Data analysis with R”, University of Lagos, Lagos Nigeria March 12-14 2018.
- C. Thron, “Introduction to Python”. Institute of Mathematics and Physics, Porto Novo, Benin Feb 27-March 2 2018.
- M. Roberts and C. Thron, “R and RStudio for Statistical Computing”. U.S. Army Operational Test Command (Test Technology Directorate), August 21-23 2017.
- C. Thron, “A hands-on introduction to Octave/Matlab”. University of Lagos, Lagos Nigeria, March 7-9, 2016.

C. Thron, "Introduction to Mathematical Software". University of Lagos, Lagos Nigeria, March 17-18, 2015.

### ONLINE

**Youtube playlists:** <https://www.youtube.com/user/coachmath3/playlists>

**Online tutorials:** <http://rtutorial.altervista.org/>

**Online profiles:**

*National Center for Biotechnology Information:*

<https://www.ncbi.nlm.nih.gov/myncbi/christopher.thron.1/bibliography/public/>

*Researchgate:* <https://www.researchgate.net/profile/Christopher-Thron-2>

*Google scholar:* <https://scholar.google.com/citations?user=ZqVV6zwAAAAJ&hl=en>

*Orcid:* <https://orcid.org/0000-0002-8960-2504>

*SSRN profile (Elsevier):* [https://papers.ssrn.com/sol3/cf\\_dev/AbsByAuth.cfm?per\\_id=2397717](https://papers.ssrn.com/sol3/cf_dev/AbsByAuth.cfm?per_id=2397717)

**Recent Arxiv preprints:**

Thron, C., & Welsch, B. (2021). Sliced, not Splitted: a Better Alternative to Many-Worlds?. arXiv preprint arXiv:2110.00580.

Thron, C., & Ali, M. (2021). Math That Matters: Enhancing Academic Mathematics' Impact on Society. arXiv preprint arXiv:2103.17067.

Thron, C., Tran, K., & Raquepas, J. (2020). High Performance Low Complexity Multitarget Tracking Filter for a Array of Non-directional Sensors. arXiv preprint arXiv:2009.08310.

### GRANTS AND FELLOWSHIPS

Fulbright Faculty Fellowship, Catholic University of Cuenca, Cuenca Ecuador, February 2022-April 2022. Teaching intensive graduate-level course on mathematical epidemiology, and building research capacity in mathematical epidemiology.

International Mathematical Union, Commission on Developing Countries, Volunteer Lecturer Program, Jan-Feb 2022. Delivered courses on Stochastic Processes at University of Lagos (Lagos, Nigeria).

College of Arts and Sciences Research Award, Texas A&M University-Central Texas, Fall 2021. Collaborative research with faculty of the University of N'Gaoundéré, Cameroon.

International Mathematical Union, Commission on Developing Countries, Volunteer Lecturer Program, May-July 2021. Delivered courses on Computational Finite Elements at University of Dschang (Dschang, Cameroon) and University of Ilorin (Ilorin, Nigeria).

Faculty Senate Summit Scholarship, Texas A&M University-Central Texas (2020 and 2021).

Air Force Summer Faculty Fellowship, Air Force Research Laboratory, Rome NY (May-July 2020: extended Nov-Dec 2020. Uncertainty Propagation for Space Situational Awareness

(Advisor: Joseph Raquepas).

Outstanding Qualitative Scholarship Award, Texas A&M University-Central Texas (2020).

International Mathematical Union, Commission on Developing Countries, Volunteer Lecturer Program, January 2020. Delivered course on Abstract Algebra (Ring Theory) at Alzaiem Alazhari University, School of Education (Omdurman, Sudan).

Fulbright Regional Travel Award, March 2019: Conference participation, ICAPTA conference, National Mathematical Center, Abuja Nigeria.

Fulbright Faculty Fellowship, Alzaiem Alazhari University and African University of Science and Technology, December 2018-September 2019. Teaching numerical analysis and mathematical modeling; research in data mining, data visualization, and medical informatics.

UTMOST grant participant (NSF) for the development of online mathematics textbooks. (2018)

International Mathematical Union, Commission on Developing Countries, Volunteer Lecturer Program, January-March 2018. Delivered courses in linear algebra and stochastic processes at the University of Lagos (Nigeria), and on Python programming at the Institut de Mathématiques et de Sciences Physiques (Porto Novo, Benin).

International Mathematical Union, Commission on Developing Countries, Volunteer Lecturer Program, November-December 2017. Delivered graduate and undergraduate courses in mathematical software (Python) at the University of Ilorin (Nigeria).

College of Arts and Sciences Research Award, Texas A&M-Central Texas, Fall 2017. Machine Learning: Applications and Implementations

Fulbright Specialist Award, Alzaiem Alazhari University, Sudan Africa (November 2016). Development of Medical Informatics curriculum and promoting interdisciplinary research for social applications of computer science.

Air Force Summer Faculty Fellowship, Air Force Research Laboratory, Rome NY (June-Aug 2016: extended October 2016) Design of wireless sensor networks for pedestrian location via WiFi signals (Advisor: Douglas Smith).

Fulbright Specialist Award, University of N'Djamena Department of Mathematics, Chad Africa (May-June 2016). Taught mathematics and computer science to upper-level students and developed electronic teaching materials.

International Mathematical Union, Commission on Developing Countries, Volunteer Lecturer Program, March-April 2016. Sponsored Master's-level classes at the University of N'Gaoundéré ENSAI (Cameroon) in numerical analysis and applied statistics, and one course in mathematical software (Octave/Matlab) at the University of Ilorin (Nigeria).

International Mathematical Union, Commission on Developing Countries, Volunteer Lecturer Program, March-April 2015. Sponsored Master's-level classes in numerical analysis and 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 – Aug 2011) 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.

Co-investigator, 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.

### **UNIVERSITY SERVICE**

College of Arts and Sciences, Chair of Department of Science and Mathematics ()

Distinguished graduate faculty (2018-present)

Grad council (2012-present): Grad policy committee chair (2020-21)

College of Arts and Sciences curriculum committee (2018-2020)

Faculty Senate (Spring 2020-present)

### **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)