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PROFESSIONAL INTERESTS

Dr. Mohammed Olama has led and participated in several projects under various DOE, DOD, and DHS programs. He has been involved in various modeling, simulations, controls, and communications projects for improved critical infrastructure efficiency, reliability, and security including the smart grid and healthcare. His research interests include smart grid and smart buildings; smart grid communications and control; building-to-grid integration; cyber-physical systems; infrastructure modeling and analysis; renewable energy siting; SCADA systems; big data integration and analytics; healthcare data analytics and hazard detection; statistical learning, forecasting, and inference algorithms; machine learning; artificial intelligence; complex systems; statistical signal processing; stochastic channel modeling, power control and localization in wireless networks; wireless sensor networks; wireless security; and discrete-event simulation.

PROFESSIONAL EXPERIENCE

- 04/20 – Present Computational Sciences and Engineering Division, Oak Ridge National Laboratory, TN
Senior Research Staff: R&D on grid-interactive efficient buildings, smart grid and smart buildings, resilient distribution systems, and hazard detection in healthcare systems
- 01/18 – Present Electrical Engineering and Computer Science Department, University of Tennessee, Knoxville, TN
Adjunct Associate Professor: Teaching several electrical engineering graduate (Linear Systems Theory) and undergraduate (Digital Control, Communication Systems, Circuits II) courses, Serving on Research Committees for Master and Doctorate students.
- 12/09 – 03/20 Computational Sciences and Engineering Division, Oak Ridge National Laboratory, TN
Research Staff: R&D on smart grid system modeling and simulation, power grid security and reliability, building-to-grid integration, secure and reliable communications for the smart grid, healthcare data analytics and integration, and big data analytics
- 11/07 – 11/09 Computational Sciences and Engineering Division, Oak Ridge National Laboratory, TN
Post-Doctoral Associate: R&D on smart grid and renewable energy siting, threat anticipation using Bayesian belief networks, and discrete-event modeling and optimization of passenger/cargo flow in an international airport facility
- 05/07 – 08/07 Computational Sciences and Engineering Division, Oak Ridge National Laboratory, TN
Summer Internship: R&D on control of power grid over communication networks with application to wide area measurement systems (WAMS)
- 08/03 – 10/07 Electrical Engineering and Computer Science Department, University of Tennessee, Knoxville, TN
Research Assistant: R&D on time varying channel modeling, stochastic power control, and mobile location estimation in wireless ad hoc and cellular networks
Teaching Assistant: Supervised laboratory, graded exams and assignments, and occasionally given classes for Electrical and Electronic Circuits (ECE 300, 301, and 302) and Probability Theory (ECE 313)
- 08/01 – 07/03 Systems Engineering Department, University of Arkansas at Little Rock, Little Rock, AR
Research Assistant: R&D on designing microwave devices and antennas
Teaching Assistant: Supervised Communications and Electronics Circuits Laboratories

- 08/99 – 08/01 Controls and Software Division, National Electric Power Company, Amman, Jordan
Control Engineer: Maintained and operated the SCADA system for the Jordanian power grid in both the hardware and the software fields
- 02/99 – 07/99 Electrical Engineering Department, University of Jordan, Amman, Jordan
Teaching Assistant: Supervised Electrical Circuits Laboratory

EDUCATION

- Ph.D. Electrical Engineering and Computer Science Department, Dec. 2007
University of Tennessee, Knoxville, TN
Dissertation: Stochastic signal processing and power control for wireless communication systems
GPA 4.0/4.0
- Applied Science Department, Aug. 2001 - Aug. 2003 (Transfer to the University of Tennessee)
University of Arkansas at Little Rock, Little Rock, AR
GPA 4.0/4.0
- M.S. Electrical and Computer Engineering Department, Jan. 2001
University of Jordan, Amman, Jordan
GPA 3.81/4.0
- B.S. Electrical and Computer Engineering Department, Aug. 1998
University of Jordan, Amman, Jordan

HONORS AND AWARDS

1. 2020-2022 Period Best Paper Award, International Journal of Electrical Power & Energy Systems.
2. Supplemental Performance Award, Computing and Computational Sciences Directorate, Oak Ridge National Laboratory, 2023 and 2020
3. Best mentor award, Computational Sciences and Engineering Division, Oak Ridge National Laboratory, 2019
4. Best paper award in the IEEE 9th International Symposium on Power Electronics for Distributed Generation Systems (PEDG), 2018
5. Inclusion in the IBC's Top 100 Scientists, 2015
6. Inclusion in Marquis Who's Who in the World, 2013
7. Inclusion in Marquis Who's Who in America, 2011
8. Best paper award in the IEEE 1st Mediterranean Conference on Intelligent Systems and Automation, 2008
9. Significant Event Award (SEA) in recognition of significant contribution to the CVG International Airport Air Cargo Detection Pilot Program, Computational Sciences and Engineering Division, Oak Ridge National Laboratory, 2007
10. Scholarly Activities Research Incentive Fund (SARIF) Summer Graduate Research Assistantship for two consecutive years 2006 and 2007
11. Member of the Phi Kappa Phi Honor Society since 2006
12. Overall 4.0 GPA Award, Applied Science Department, University of Arkansas at Little Rock, 2003

RESEARCH GRANTS

- Led and participated in several projects under various DOE, DOD, and DHS programs that include:
 1. **COSMIC: Distributed Analysis of Wireless at Nextscale (DAWN)**
 - Funding Agency: DOD
 - Total Amount: \$1,600,000
 - Role: Contributor, with Jeffrey Vetter (PI)
 - Funding Duration: 10/2022 – 09/2024
 2. **DarkNet: Data Analytics - Event Correlation and Machine Learning**
 - Funding Agency: DOE, OE

- Total Amount: \$1,375,000
 - Role: Contributor, with Nils Stenvig (PI)
 - Funding Duration: 10/2023 – 09/2024
- 3. Secure pathways for Resilient Communications**
 - Funding Agency: DOE, OE
 - Total Amount: \$800,000
 - Role: Contributor, with Tim Daniel (PI)
 - Funding Duration: 10/2023 – 09/2024
 - 4. Quantum Key Distribution (QKD) Applicability to Smart Grid Cybersecurity Systems**
 - Funding Agency: DOE, OE
 - Total Amount: \$800,000
 - Role: Contributor, with Warren Grice (PI)
 - Funding Duration: 10/2022 – 09/2023
 - 5. Hierarchical Model-Free Transactive Control of Building Loads to Support Grid Services**
 - Funding Agency: DOE, EERE, BTO
 - Total Amount: \$2,100,000
 - Role: PI
 - Funding Duration: 10/2018 – 09/2022
 - 6. Switched Mode Controls for Guaranteeing Resilient Operation of the Smart Grid**
 - Funding Agency: ORNL, LDRD, TEST Initiative
 - Total Amount: \$800,000
 - Role: PI
 - Funding Duration: 10/2017 – 09/2019
 - 7. A New Integrated Signaling-Encryption Technique to Reduce Error Propagation in Wireless Communications**
 - Funding Agency: ORNL, LDRD, SEED
 - Total Amount: \$190,000
 - Role: PI
 - Funding Duration: 04/2014 – 09/2015
 - 8. Resilient Operation of Networked Community Microgrids with High Solar Penetration**
 - Funding Agency: DOE, EERE, SETO
 - Total Amount: \$3,000,000
 - Role: Contributor, with Ben Ollis (PI)
 - Funding Duration: 10/2021 – 09/2024
 - 9. Dynamic Building Load Control to Facilitate High Penetration of Solar Photovoltaic Generation**
 - Funding Agency: DOE, EERE, SETO
 - Total Amount: \$3,000,000
 - Role: Co-PI, with Teja Kuruganti (PI)
 - Funding Duration: 02/2016 – 09/2021
 - 10. Real-Time Automated Health Information Technology Hazard Detection**
 - Funding Agency: DOD, VA
 - Total Amount: \$10,000,000
 - Role: Contributor, with Teja Kuruganti (PI)
 - Funding Duration: 06/2018 – 09/2022
 - 11. Integration of Responsive Residential Loads into Distribution Management Systems**
 - Funding Agency: DOE, GMLC
 - Total Amount: \$5,000,000
 - Role: Contributor, with Teja Kuruganti (PI)
 - Funding Duration: 10/2018 – 09/2022

12. Cyber-physical False Data Attack Detection in Smart Grids

- Funding Agency: ORNL, LDRD
- Total Amount: \$800,000
- Role: Co-PI, with Erik Ferragut (PI)
- Funding Duration: 10/2015 – 09/2017

13. Real-time Urban Activity Monitoring using Pervasive Sensor Network

- Funding Agency: ORNL, LDRD
- Total Amount: \$800,000
- Role: Co-PI, with Teja Kuruganti (PI)
- Funding Duration: 10/2016 – 09/2019

14. Low-Cost Multi-Modal Wireless Sensor Platform for Smart Buildings

- Funding Agency: DOE, EERE, BTO
- Total Amount: \$3,000,000
- Role: Contributor, with Teja Kuruganti (PI)
- Funding Duration: 10/2015 – 09/2018

15. Scalable Coordination and Control of Microgrid Generation, Load, and Storage

- Funding Agency: ORNL, LDRD
- Total Amount: \$800,000
- Role: Co-PI, with Alex Melin (PI)
- Funding Duration: 10/2015 – 09/2017

16. Deep Learning for Automated Feature Discovery to Enhance Cyber Threat Detection

- Funding Agency: ORNL, LDRD
- Total Amount: \$1,000,000
- Role: Co-PI, with Jason Laska (PI)
- Funding Duration: 10/2017 – 09/2019

17. Healthcare Big Data Analytics and Integration

- Funding Agency: CMS
- Total Amount: \$9,000,000
- Role: Contributor, with Brian Worley (PI)
- Funding Duration: 10/2012 – 09/2014

18. Optimizing Renewable Energy Investment and Deployment

- Funding Agency: DOE, Lockheed Martin
- Total Amount: \$700,000
- Role: Contributor, with Arjun Shankar (PI)
- Funding Duration: 10/2009 – 09/2011

19. Threat Anticipation using Bayesian Belief Networks

- Funding Agency: Battelle IR&D
- Total Amount: \$250,000
- Role: Contributor, with Glenn Allgood (PI)
- Funding Duration: 10/2008 – 09/2009

20. Modeling of Passenger/Baggage/Cargo Flow and Inspection using Discrete-event Simulation

- Funding Agency: DHS
- Total Amount: \$5,000,000
- Role: Contributor, with Terri Rose (PI)
- Funding Duration: 11/2007 – 09/2009

21. Modeling and Estimation of Wireless Communication Networks

- Funding Agency: DOE, ITP
- Total Amount: \$500,000
- Role: Contributor, with Wayne Manges (PI)

PUBLICATIONS IN WIRELESS COMMUNICATIONS AND APPLICATIONS

PAPERS IN REFEREED JOURNALS

- J56. Y. Khattabi, M.M. Matalgah, and **M.M. Olama**, “Revisiting Lightweight Encryption for IoT Applications: Error Performance and Throughput in Wireless Fading Channels With and Without Coding,” *IEEE Access*, vol. 8, no. 1, pp. 13429-13443, Jan. 2020.
- J55. M.U. Alhuseini and **M.M. Olama**, “5G Service Value Chain and Network Slicing Framework using Ecosystem Modeling, Agile Delivery, and User-Story Automation,” *IEEE Access*, vol. 7, no. 1, pp. 110856-110873, Oct. 2019.
- J54. **M.M. Olama**, X. Ma, S.M. Killough, T. Kuruganti, S.F. Smith, and S.M. Djouadi, “Analysis, Optimization, and Implementation of a Hybrid DS/FFH Spread-Spectrum Technique for Smart Grid Communications,” *EURASIP Journal on Advances in Signal Processing*, vol. 2015, no. 25, pp. 1-18, Mar. 2015.
- J53. **M.M. Olama**, S.M. Djouadi and C.D. Charalambous, “Stochastic Modeling and Power Control of Time-Varying Wireless Communication Networks,” *Communications and Networks*, vol. 6, no. 3, pp. 155-164, Aug. 2014.
- J52. **M.M. Olama**, S.M. Djouadi, Y. Li and A. Fathy, “Modeling, Real-Time Estimation, and Identification of UWB Indoor Wireless Channels,” *International Journal of Antennas and Propagation, Special Issue on Radio Wave Propagation and Wireless Channel Modeling*, vol. 2013, 8 pages, Nov. 2013.
- J51. **M.M. Olama**, S.M. Djouadi, and C.D. Charalambous, “Stochastic Differential Equations for Modeling, Estimation and Identification of Mobile-to-Mobile Communication Channels,” *IEEE Transactions on Wireless Communications*, vol. 8, no. 4, pp. 1754-1763, 2009.
- J50. **M.M. Olama**, S.M. Djouadi, I.G. Papageorgiou, and C.D. Charalambous, “Position and Velocity Tracking in Mobile Networks Using Particle and Kalman Filtering with Comparison,” *IEEE Transactions on Vehicle Technology*, vol. 57, no. 2, pp. 1001 – 1010, 2008.
- J49. S.M. Djouadi, **M.M. Olama**, and Y. Li, “Optimal Approximation of the Impulse Response of Wireless Channels by Stochastic Differential Equations,” *IEEE Signal Processing Letters*, vol. 15, pp. 896-899, 2008.
- J48. **M.M. Olama**, K.K. Jaladhi, S.M. Djouadi, and C.D. Charalambous, “Recursive Estimation and Identification of Time-Varying Long-Term Fading Channels,” *Research Letters in Signal Processing*, vol. 2007, Article ID 17206, 5 pages, 2007.
- J47. **M.M. Olama**, S.M. Djouadi, and C.D. Charalambous, “Stochastic Power Control for Time-Varying Long-Term Fading Wireless Networks,” *EURASIP Journal on Applied Signal Processing*, vol. 2006, Article ID 89864, 13 pages, 2006.

BOOK CHAPTERS

- BC2. **M.M. Olama**, S.M. Djouadi and C.D. Charalambous, “Wireless Fading Channel Models: From Classical to Stochastic Differential Equations,” In C. Myers (Editor), *Stochastic Control*, pp. 299-328, Published by Sciyo, Rijeka, Croatia, 2010.
- BC1. **M.M. Olama**, S.M. Djouadi, C.D. Charalambous, I.G. Papageorgiou, and T. Kuruganti “Position and Velocity Tracking in Cellular Networks Using the Kalman Filter,” In V. Moreno and A. Pigazo (Eds.), *Kalman Filter: Recent Advances and Applications*, pp. 229-250, I-Tech Education and Publishing KG, Vienna, Austria, 2009.

PAPERS IN REFEREED CONFERENCES

- C138. M. Wise, M. N. Rao, S. Hitefield, **M.M. Olama**, and J. S. Vetter, “COSMIC DAWN: Distributed Analysis of Wireless at Nextscale,” IEEE Military Communications Conference (MILCOM), Oct. 2024.
- C137. M. Wise, S. Hitefield, N. Mniskar, **M.M. Olama**, and J. Vetter, “Distributed Analysis of Wireless at Nextscale,” in *Proc. of the ACM Mid-Southeast 2023*, Nov. 2023.
- C136. S. Killough, **M.M. Olama**, and T. Kuruganti, “Gold Code-Phase-Shift Keying: A Power and Bandwidth Efficient Communication Scheme for Smart Buildings,” in *Proc. of the IEEE International Communications Quality and Reliability Workshop, (CQR'18)*, Austin, TX, May 2018.
- C135. **M.M. Olama**, T. Kuruganti, M. Bobrek, S. Killough, J. Nutaro, and G. Thakur, “Real-time Cellular Activity Monitoring Using LTE Radio Measurements,” in *Proc. of the IEEE International Symposium on Personal, Indoor and Mobile Radio Communications (PIMRC)*, Oct. 2017.

- C134. **M.M. Olama**, M.M. Matalgah, and M. Bobrek, "An Integrated Signaling-Encryption Mechanism to Reduce Error Propagation in Wireless Communications: Performance Analyses," in *Proc. of the IEEE International Communications Quality and Reliability (CQR) Conference*, May 2015.
- C133. **M.M. Olama**, S.M. Killough, T. Kuruganti and T.E. Carroll, "Design, Implementation, and Evaluation of a Hybrid DS/FFH Spread-Spectrum Radio Transceiver," in *Proc. of the IEEE Military Communication Conference (MILCOM'14)*, Oct. 6-8, 2014.
- C132. X. Ma, **M.M. Olama**, T. Kuruganti, S.F. Smith, and S.M. Djouadi, "Security of Classic PN-Spreading Codes for Hybrid DS/FFH Spread-Spectrum Systems," in *Proc. of the IEEE Military Communication Conference (MILCOM'13)*, pp. 957-962, Nov. 18-20, 2013.
- C131. T. Kuruganti, M. Bobrek, P.G. Evans, W.P. Grice, and **M.M. Olama**, "Quantum Key Distribution (QKD) Applicability to Smart Grid Cybersecurity Systems," in *Proc. of the Single Photon Workshop*, Oct. 15-18, 2013.
- C130. S.M. Killough, **M.M. Olama**, T. Kuruganti, and S.F. Smith, "FPGA-Based Implementation of a Hybrid DS/FFH Spread-Spectrum Transceiver," in *Proc. of the World Congress in Computer Science, Computer Engineering, and Applied Computing (WORLDCOMP'13)*, July 22-25, 2013.
- C129. M. Aulama and **M.M. Olama**, "Coexistence Analysis of Adjacent Long-Term Evolution (LTE) Systems," in *Proc. of the IEEE International Conference on Computing, Networking and Communications (ICNC'13)*, pp. 162-167, Jan. 28-31, 2013.
- C128. Y. Li, S.M. Djouadi, and **M.M. Olama**, "On Optimal Input Design and Model Selection for Communication Channels," in *Proc. of the IEEE International Conference on Computing, Networking and Communications (ICNC'13)*, pp. 1085-1089, Jan. 28-31, 2013.
- C127. X. Ma, **M.M. Olama**, T.P. Kuruganti, S.F. Smith, and S.M. Djouadi, "Determining System Parameters for Optimal Performance of Hybrid DS/FFH Spread-Spectrum," in *Proc. of the IEEE Military Communication Conference (MILCOM'12)*, pp. 1888-1893, Oct. 29-Nov. 1, 2012.
- C126. **M.M. Olama**, S.F. Smith, P.T. Kuruganti, and X. Ma, "Performance Study of Hybrid DS/FFH Spread-Spectrum Systems in the Presence of Frequency-Selective Fading and Multiple-Access Interference," in *Proc. of the IEEE International Communications Quality and Reliability (CQR) Conference*, May 15-17, 2012.
- C125. **M.M. Olama**, G.O. Allgood, T.P. Kuruganti, and J.E. Lake, "An Energy Signature Scheme for Steam-Trap Assessment and Flow-Rate Estimation Using Pipe-Induced Vibration Measurements," in *Proc. of the SPIE Defense, Security and Sensing Conference*, Apr. 23-27, 2012.
- C124. **M.M. Olama**, X. Ma, P.T. Kuruganti, S.F. Smith, and S.M. Djouadi, "Hybrid DS/FFH Spread Spectrum: A Robust, Secure Transmission Technique for Communication in Harsh Environments," in *Proc. of the IEEE Military Communications Conference (MILCOM'11)*, pp. 2136-2141, Nov. 7-10, 2011.
- C123. **M.M. Olama**, G.O. Allgood, T.P. Kuruganti, S.R. Sukumar, S.M. Djouadi, and J.E. Lake, "Steam Distribution and Energy Delivery Optimization using Wireless Sensors," in *Proc. of the SPIE Defense, Security and Sensing Conference*, vol. 8024, 11 pages, Apr. 25-29, 2011.
- C122. X. Ma, **M.M. Olama**, S.M. Djouadi, and C.D. Charalambous, "Estimation and Identification of Time-Varying Long-Term Fading Channels via the Particle Filter and the EM Algorithm," in *Proc. of the IEEE Radio and Wireless Symposium*, pp. 13-16, Jan. 16-19, 2011.
- C121. Y. Li, **M.M. Olama**, S.M. Djouadi, A. Fathy, and T. Kuruganti, "Stochastic UWB Wireless Channel Modeling and Estimation from Received Signal Measurements," in *Proc. of the IEEE Radio and Wireless Symposium*, pp. 195-198, Jan. 18-22, 2009.
- C120. **M.M. Olama**, Y. Li, S.M. Djouadi, and C.D. Charalambous, "Stochastic Wireless Channel Modeling, Estimation and Identification from Measurements," in *Proc. of the 1st Mediterranean Conference on Intelligent Systems and Automation (CISA)*, pp. 433-438, Jun. 30 – Jul. 2, 2008. **(Best Paper Award)**
- C119. **M.M. Olama**, S.M. Djouadi, I.G. Papageorgiou, and C.D. Charalambous, "Estimation of Mobile Station Position and Velocity in Multipath Wireless Networks Using the Unscented Particle Filter," in *Proc. of the 46th IEEE Conference on Decision and Control*, pp. 4590-4595, Dec. 12-14, 2007.
- C118. **M.M. Olama**, Y. Li, S.M. Djouadi, T. Goodspeed and P.T. Kuruganti, "Recursive Estimation and Identification of Wireless Ad Hoc Channels from Measurements," in *Proc. of the 3rd International Conference on Wireless Internet (WICON'07)*, Oct. 22-24, 2007.
- C117. **M.M. Olama**, S.M. Djouadi, C.D. Charalambous, and S. Sahyoun "Distributed Stochastic Power Control for Time Varying Long-Term and Short-Term Fading Wireless Networks," in *Proc. of the IEEE American Control Conference (ACC)*, pp. 3088-3093, July 11-13, 2007.

- C116. **M.M. Olama**, Y. Li, S.M. Djouadi, and C.D. Charalambous, "Time Varying Wireless Channel Modeling, Estimation, Identification, and Power Control from Measurements," in *Proc. of the IEEE American Control Conference*, pp. 3100-3105, July 11-13, 2007.
- C115. **M.M. Olama**, K.K. Jaladhi, S.M. Djouadi, and C.D. Charalambous, "Estimation and Identification of Time Varying Long-Term Fading Wireless Channels with Application to Power Control," in *Proc. of the European Control Conference*, pp. 1886-1893, July 2-5, 2007.
- C114. **M.M. Olama**, S.M. Djouadi, and C.D. Charalambous, "A General Framework for Continuous Time Power Control in Time Varying Long-Term Fading Wireless Networks," in *Proc. of the 9th IASTED International Conference on Control and Applications*, pp. 69-74, May 30-June 1, 2007.
- C113. **M.M. Olama**, S.M. Djouadi, and C.D. Charalambous, "Position and Velocity Tracking in Cellular Networks Using Particle and Kalman Filtering with Comparison," in *Proc. of the 45th IEEE Conference on Decision and Control*, pp. 1315-1320, Dec. 13-15, 2006.
- C112. **M.M. Olama**, S.M. Djouadi, and C.D. Charalambous, "Stochastic Channel Modeling for Ad Hoc Wireless Networks," in *Proc. of the IEEE American Control Conference*, pp. 6075-6080, June 14-16, 2006.
- C111. **M.M. Olama**, S.M. Djouadi, and C. Pendley, "Position and Velocity Tracking in Mobile Cellular Networks Using the Particle Filter," in *Proc. of the IEEE Wireless Communications and Networking Conference (WCNC)*, vol. 1, pp. 165-170, April 3-6, 2006.
- C110. **M.M. Olama**, S.M. Djouadi, and C.D. Charalambous, "Time Varying Channel Modeling for Ad-hoc Mobile Wireless Networks," in *Proc. of the IEEE Wireless Communications and Networking Conference (WCNC)*, vol. 3, pp. 1277-1282, April 3-6, 2006.
- C109. **M.M. Olama**, S.M. Shajaat, S.M. Djouadi, and C.D. Charalambous, "Stochastic Power Control for Time-Varying Flat Fading Wireless Channels," in *Proc. of the 16th IFAC World Congress*, July 4-8, 2005.
- C108. **M.M. Olama**, S.M. Djouadi, and C.D. Charalambous, "Stochastic Power Control for Time-Varying Fading Wireless Communication Networks," in *Proc. of the 13th IEEE Mediterranean Conference on Control and Automation*, pp. 713-718, June 27-29, 2005.
- C107. **M.M. Olama**, S.M. Shajaat, S.M. Djouadi, and C.D. Charalambous, "Stochastic Power Control for Time-Varying Lognormal Fading Wireless Channels," in *Proc. of the IEEE American Control Conference*, vol. 3, pp. 1817-1822, June 8-10, 2005.

TECHNICAL REPORTS

- TR20. A. Lee, W. Grice, **M.M. Olama**, and P. Evans, "Quantum Key Distribution Applicability to Smart Grid Cybersecurity Systems," ORNL Technical Report, Sep. 2024.
- TR19. T. Kuruganti, S. Killough, **M.M. Olama**, P. Joshi, C. Winstead, S. Fulton, D. English, and C. Ray, "Low-Cost Multi-Modal Wireless Sensor Platform for Smart Buildings," ORNL Technical Report, ORNL/TM-2018/934, CRADA/NFE-14-05348, Feb. 2019.
- TR18. T. Kuruganti, M. Bobrek, P.G. Evans, W.P. Grice, **M.M. Olama** "Quantum Key Distribution Applicability to Smart Grid Cybersecurity Systems," ORNL Technical Report, Mar. 2014.
- TR17. **M.M. Olama**, G.O Allgood, T. Kuruganti, S.R. Sukumar, K. Woodworth, and J.E. Lake, "Wireless Sensing, Monitoring and Optimization for Campus-Wide Steam Distribution," Technical Report, Department of Energy's (DOE) Information Bridge: DOE Scientific and Technical Information, Oak Ridge National Laboratory, ORNL/TM-2011/441, Nov. 2011.
- TR16. R. Kisner, W. Manges, and **M.M. Olama**, "Cybersecurity through Real-Time Distributed Control Systems," Technical Report, Department of Energy's (DOE) Information Bridge: DOE Scientific and Technical Information, Oak Ridge National Laboratory, ORNL/TM-2010/30, Feb. 2010.

INVENTION DISCLOSURE

- ID10. S.M. Killough, T. Kuruganti, C. Liu, J. Moehl, **M.M. Olama**, G. Thakur, and C.J. Winstead, "UrbanSense: Real-time Urban Activity Monitoring Using Pervasive Sensor Network," ORNL Invention Disclosure 201703976, DOE S-138,640, Dec. 2017.

PUBLICATIONS IN SMART GRID APPLICATIONS

PAPERS IN REFEREED JOURNALS

- J46. S. Dulal, C. Zhang, **M.M. Olama**, Q. Liu, N. Bhisal, A. P. Yadav, M. Baldwin, N. Stenviig, and Y. Liu, "Inertia Estimation and Trend Analysis of the United States Power Grid Interconnections," *Submitted to IEEE Access*, Sep. 2024.
- J45. H. Fu, W. Yu, **M.M. Olama**, N. Bhusal, A.P. Yadav, N. Stenvig, and Y. Liu, "Statistical Analysis of Inter-area Oscillations in the U.S. Eastern Interconnection: A 2017-2023 Perspective," *Submitted to IEEE Access*, Sep. 2024.
- J44. Y. Su, D. Li, F. Wang, **M.M. Olama**, M. F. Ferrari, B. Ollis, and Y. Liu, "Real-time Power Balance Control of Dynamic Boundary Microgrids Through Preventive Switching," *Submitted to IEEE Transactions on Smart Grid*, Aug. 2024.
- J43. O. Alaca, E. Piescirovsky, A. R. Ekti, N. Stenvig, Y. Gui, **M.M. Olama**, N. Bhusal, and A. Yadav, "Assessment of Envelope- and Machine Learning-Based Electrical Fault Type Detection Algorithms for Electrical Distribution Grids," *Submitted to Electronics*, Aug. 2024.
- J42. Y. Su, D. Li, F. Wang, **M.M. Olama**, M. Ferrari, B. Ollis, and Y. Liu, "Flexible Dynamic Boundary Microgrid Operation Considering Network and Load Unbalances," *Applied Energy*, vol. 371, Article ID 123633, Oct. 2024.
- J41. D. Li, Y. Su, F. Wang, **M.M. Olama**, B. Ollis, and M. F. Ferrari, "A Two-Stage Fault Ride-Through Strategy for Grid-Forming Inverters Considering Grid Voltage Requirements," *Submitted to IEEE Transactions on Power Delivery*, May 2024.
- J40. Y. Chen, **M.M. Olama**, M. F. Ferrari, G. Liu, Q. Shi, A. Sundararajan, B. Park, A. Massol-Deya, B. Ollis, "Optimal Network Reconfiguration and Scheduling with Hardware-in-the-Loop Validation for Improved Microgrid Resilience," *Submitted to IEEE Open Access Journal of Power and Energy*, May 2024.
- J39. E. Piescirovsky, N. Stenvig, Y. Gui, **M.M. Olama**, N. Bhusal, and A. Yadav, "Advanced Testbed to Assess Disturbances in Electrical Grids with DERs using Relays/Meters with Varying Sampling Frequencies," *Energy Reports*, vol. 11, pp. 6032-6047, June 2024.
- J38. E. Tsybina, C. Winstead, B. Ollis, **M.M. Olama**, and T. Kuruganti, "Recent developments in research of demand response for frequency regulation: research continuity and knowledge gaps," *Submitted to Renewable and Sustainable Energy*, Mar. 2024.
- J37. F. Taousser, S. Morovati, Y. Zhang, S.M. Djouadi, K. Tomsovic, and **M.M. Olama**, "New Safety Feedback Control Design to Guarantee Adequate Frequency Performance in Microgrids," *Submitted to International Journal of Robust and Nonlinear Control*, Mar. 2024.
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- J7. H. Niu, O. A. Omitaomua, Q. Cao, O. Ozmen, H. B. Klasky, **M.M. Olama**, L. Pullum, A. Thakur Malviya, T. Kuruganti, J. Scott, A. Laurio, F. Drews, M. Ward, and J. Nebeker, “An Efficient Network-Based Method for Detecting Anomalous Sequences in Electronic Health Records Data,” *Submitted to Journal of Biomedical Informatics*, May 2024.
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- ID1. W. McNair, **M.M. Olama**, J. Nutaro, and S.R. Sukumar, “Data Management Maturity Model,” ORNL Invention Disclosure 201303212, DOE S# S-124,817, Apr. 2014.

PROFESSIONAL SERVICES

- Served on the Seed Money Review Committee, Oak Ridge National Laboratory, 2020-2022
- Mentored 7 undergraduate students in their senior design project in the EECS department at UTK, 2023-2024
- Mentored 6 undergraduate students in their senior design project in the EECS department at UTK, 2022-2023

SESSION CHAIR FOR

- The International Conference on Computational Science and Computational Intelligence (CSCI), 2017
- IEEE North American Power Symposium (NAPS), 2017
- SPIE Defense, Security and Sensing Conference, 2010, 2011, 2013, 2014
- IEEE American Control Conference, 2007, 2019

REVIEWER FOR

- IEEE Transactions on Smart Grid
- IEEE Transactions on Power Systems
- IEEE Transactions on Communications
- IEEE Transactions on Wireless Communications
- IEEE Transactions on Automatic Control
- IEEE Transactions on Vehicle Technology
- IEEE Signal Processing Letters
- IEEE Communication Letters
- IET Generation, Transmission & Distribution
- IET Energy Systems Integration
- IET Wireless Sensor Systems Journal
- Automatica Journal
- Signal Processing Journal (Elsevier)
- Applied Energy (Elsevier)
- IEEE Access
- Energies
- Asian Journal of Control
- IEEE Power & Energy Society General Meeting Conference
- IEEE Conference on Innovative Smart Grid Technologies
- IEEE Global Communications Conference
- IEEE Military Communications Conference
- IEEE American Control Conference
- IEEE Conference on Decision and Control
- European Control Conference
- IEEE Wireless Communications and Networking Conference
- IEEE Mediterranean Conference on Control and Automation
- IEEE International Symposium on Power Electronics for Distributed Generation Systems
- Mediterranean Conference on Intelligent Systems and Automation
- IEEE Multi-conference on Systems and Control
- The Institute of Industrial and Systems Engineers (IISE) Annual Conference & Expo
- IEEE International Multi-Topic Conference
- Emerging Applications of M&S in Industry and Academia (EAIA) Symposium

ADVISOR/MENTOR FOR

- Mr. Saurav Dulal (UTK doctorate student)
- Mr. Hao Fu (UTK doctorate student)
- Mr. Yu (Michael) Su (UTK doctorate student)
- Mr. Dingrui Li (UTK doctorate student)
- Dr. Jiecai Luo (ORNL summer faculty intern, currently with Southern University and Agricultural and Mechanical College at Baton Rouge)
- Dr. Kenan Hatipoglu (ORNL summer faculty intern, currently with West Virginia University Institute of Technology)
- Dr. Kadir Amasyali (ORNL post-doc, currently with Carrier)
- Dr. Byungkwon Park (ORNL post-doc, currently with Soongsil University)
- Dr. Yang Chen (ORNL post-doc, currently with ORNL)
- Dr. Fatima Taousser (UTK post-doc, currently with UTK)
- Mr. Dingrui Li (UTK doctorate student, currently with ABB)
- Ms. Bhagyashri Telsang (UTK doctorate student, currently with ASML)
- Mr. Tumin Wu (UTK doctorate student)
- Mr. Qingxin Shi (UTK doctorate student, currently with North China Electric Power University)
- Mr. Xiaofei Wang (UTK doctorate student, currently with National Renewable Energy Laboratory)
- Mr. Cody Rooks (UTK master student, currently with Open Systems International)

- Mr. Xiao Kou (UTK doctorate student, currently with GE Vernova)
- Mr. Yichen Zhang (UTK doctorate student, currently with the University of Texas at Arlington)
- Ms. Samaneh Morovati (UTK doctorate student, currently with Quanta Technology)
- Mr. Xiao Ma (UTK doctorate student, currently with Western Digital)
- Mr. Ani Perumalla (ORNL summer intern, currently with Pennsylvania State University)
- Ms. Evgeniya Tsybina (ORNL summer intern, currently with ORNL)

COMPUTER SKILLS

- Programming Languages: Matlab, Labview, Visual Basic, Mathematica, and Mathcad.
- Software Packages: Simulink, Wireless InSite, MultiSim, Microwave Studio, Power World, PSpice, and Electronic Work Bench (EWB).

AFFILIATIONS

- The Institute of Electrical and Electronics Engineers (IEEE) Senior Member
- IEEE Power & Energy Society (PES)
- IEEE Power Electronics Society (PELS)
- IEEE Communications Society (ComSoc)
- IEEE Control Systems Society (CSS)
- IEEE Signal Processing Society (SPS)
- IEEE Circuits and Systems Society (CASS)
- IEEE Engineering in Medicine and Biology Society (EMBS)
- Phi Kappa Phi Honor Society
- The Institute of Mathematical Statistics (IMS)
- The American Society of Mechanical Engineers (ASME)

REFERENCES

Furnished upon request