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RESEARCH

Interests	Array Signal Processing · Channel Modeling 5G & beyond · Wireless Communication · Multiuser Detection
Areas	Electrical and Electronic Engineering · Aerospace Engineering · Computer Networks and Communications · Media Technology · Artificial Intelligence · Atomic and Molecular Physics, and Optics

RESEARCH SUMMARY

57	333	8	8	0.83	7%
Publications	Citations	h-index	i10-index	Field-weighted impact	World top 10%

Counted from the 57 publications listed below, 2009–2026. Field-weighted impact is the mean over the 29 works scored for it; 1.00 is the world average for works of the same field, type and year. 2 of the 29 papers scored for it are among the world's most cited tenth for their field, type and year.

POSITIONS

Dr/Lecturer
Electrical and Electronics Engineering, Kwame Nkrumah University of Science and Technology, Kumasi, Ghana

PUBLICATIONS

Journal articles 48

1. **Emmanuel Ampoma Affum**, Osumanu Futat, Maxwell Afriyie Oppong, Moses Kwasi Torkudzor, Azingya Cosmos (2026). Hybrid CD-MMSE Two-Timescale Channel Estimation for RIS-Assisted 6G Systems. *International Journal of Communication Systems*. https://doi.org/10.1002/dac.70576
2. Ivy Georgina Sarfo-Mainoo, **Emmanuel Ampoma Affum**, Simon Amonovi, Kwadwo Ntiamoah-Sarpong, Osuman Futa, Benjamin Addo-Mensah, Amevi Acakpovi (2026). Mobility-Aware Near-Field Multi-Beam Design for XL-RIS Using Predictive Warm-Start Optimisation. *IET Communications*. https://doi.org/10.1049/cmu2.70216
3. **Emmanuel Ampoma Affum**, Osumanu Futa, Maxwell Afriyie Oppong, Daniel Owusu Biney (2026). Residual-aided CSI-free end-to-end learning for multiuser MIMO. *PLoS ONE*. https://doi.org/10.1371/journal.pone.0344696
4. **Emmanuel Ampoma Affum**, Edward Danso Ansong, Kwame Oteng Gyasi, Maxwell Afriyie Oppong, Isaac Kweku Boakye, Francois Sekyere Sekyere, Louis Owusu Annan (2025). A Stochastic Geometry Analysis on The Uplink Performance of Cell-Free Massive MIMO Systems with Hardware Impairments. *Journal of Electronics and Electrical Engineering*. https://doi.org/10.37256/jeee.4220257189
5. Maxwell Afriyie Oppong, **Emmanuel Ampoma Affum**, Kwadwo Ntiamoah-Sarpong (2025). Analyzing 5G Heterogeneous Cellular Networks: An Inclusive Examination of Throughput and Energy Efficiency. *Computer Networks and Communications*. https://doi.org/10.37256/cnc.3220256898
6. Kwaku Kwarteng, Kwame O. Gyasi, Justice O. Agyemang, Kwame Agyekum, Kingsford Kwakye, Ellis M. Sani, **Emmanuel A. Ampomah**, Kusi A. Bonsu (2025). Cat Swarm Optimization with Lévy Flight for Link Load Balancing in SDN. *Journal of Telecommunications and Information Technology*. https://doi.org/

10.26636/jtit.2025.1.1773

7. **Emmanuel Ampoma Affum** (2025). Enhanced Path Loss Prediction Using Machine Learning and Modified COST-Hata Model for High-Frequency Wireless Networks. *Journal of Electrical Systems*.
8. Owusu Agyeman Antwi, **Emmanuel Ampoma Affum**, Samuel Tweneboah-Koduah, Maxwell Afriyie Oppong, Ruhyia Abubakar, Ofosu Willie (2025). IRS-Assisted Communication in Three-Dimensional Stochastic Geometry Channel Utilising Uniform Rectangular Array Transmitters with Hardware Defects. *Wireless Personal Communications*. https://doi.org/10.1007/s11277-024-11735-7
9. **Emmanuel Ampoma Affum**, Emmanuel Obuobi Kwame Addo, Samuel Tweneboah-Koduah, Louis Owusu Annan, Owusu Agyeman Antwi, Willie Ofosu (2025). Maximizing intelligent reflecting surface (IRS) positioning in 5G wireless communication and beyond using genetic algorithms for enhanced spectral efficiency. *Annals of Telecommunications*. https://doi.org/10.1007/s12243-025-01140-x
10. **Emmanuel Ampoma Affum**, Samuel Tweneboah-Koduah, Owusu Agyeman Antwi, Benjamin Asubam Weyori, Willie Ofosu (2024). Large-Scale MIMO Transmitters for CR-NOMA in Fixed Physical Space: The Effect of Realistic System Impairments Using Stochastic Geometry. *IEEE Open Journal of Vehicular Technology*. https://doi.org/10.1109/ojvt.2024.3425061
11. **Emmanuel Ampoma Affum**, Samuel Tweneboah-Koduah, Michael Kubi Appiah, Eric Gyamfi, Sunday Adeola Ajagbe, Owusu Agyeman Antwi, Matthew Adigun (2024). Maximization of sum rate for Wireless Powered Communication Network with Intelligent Reflecting Surface and NOMA in the nonappearance of uplink and downlink beamforming matrix, subject to transmit power and time. *International Journal of Communication Systems*. https://doi.org/10.1002/dac.5911
12. Daniel Kuyoli Ngala, Kwasi Adu-Boahen Opare, **Emmanuel Ampoma Affum**, Kwame Oteng Gyasi, Kwame Opuni-Boachie Obour Agyekum (2023). A greedy algorithm for pilot contamination mitigation using LAP. *Journal of Engineering and Applied Science*. https://doi.org/10.1186/s44147-023-00239-z
13. Natasha Nigar, Abdul Jaleel, Shahid Islam, Muhammad Kashif Shahzad, **Emmanuel Ampoma Affum** (2023). IoMT Meets Machine Learning: From Edge to Cloud Chronic Diseases Diagnosis System. *Journal of Healthcare Engineering*. https://doi.org/10.1155/2023/9995292
14. Samuel Tweneboah-Koduah, **Emmanuel Ampoma Affum**, James Adu Ansere, Eric Gyamfi, Kwasi Adu-Boahen Opare, Sunday Adeola Ajagbe, Matthew O. Adigun (2023). Stochastic geometry modelling and analysis for cooperative NOMA with large transmit antennas for 5G applications and beyond. *IET Communications*. https://doi.org/10.1049/cmu2.12648
15. Samuel Tweneboah-Koduah, **Emmanuel Ampoma Affum**, Kingsford Sarkodie Obeng Kwakye, Owusu Agyeman Antwi (2022). Decode and Forward Coding Scheme for Cooperative Relay NOMA System with Cylindrical Array Transmitter. *International Journal of Advanced Computer Science and Applications*. https://doi.org/10.14569/ijacsa.2022.0131090
16. **EA Affum** (2022). Performance of CR-NOMA with Large Antenna Transmitters. *MDPI Journal of Electronics*.
17. Samuel Tweneboah-Koduah, **Emmanuel Ampoma Affum**, Kwame Agyemang-Prempeh Agyekum, Sunday Adeola Ajagbe, Matthew O. Adigun (2022). Performance of Cooperative Relay NOMA with Large Antenna Transmitters. *Electronics*. https://doi.org/10.3390/electronics11213482
18. Ayman Abdulhadi Althuwayb, Fazirulhisyam Hashim, Jiun Terng Liew, Imran Khan, Jeong Woo Lee, **Emmanuel Ampoma Affum**, Abdeldjalil Ouahabi, S閃astien Jacques (2021). A Highly Efficient Algorithm for Phased-Array mmWave Massive MIMO Beamforming. *Computers, materials & continua/Computers, materials & continua (Print)*. https://doi.org/10.32604/cmc.2021.015421
19. **Emmanuel Ampoma Affum**, Kwame Agyeman-Prempeh, Christian Adumatta, Kwadwo Ntiamoah-Sarpong, James Dzisi (2021). Smart Home Energy Management System based on the Internet of Things (IoT). *International Journal of Advanced Computer Science and Applications*. https://doi.org/10.14569/ijacsa.2021.0120290
20. Patrick Danuor, **Emmanuel Ampoma Affum** (2020). Performance Analysis of Spatially Correlated Cylindrical Antenna Array for 3D Massive MIMO. *International Journal of Wireless & Mobile Networks*. https://doi.org/10.5121/ijwmn.2020.12601

21. James D Gadze, Kwame A Agyekum, Stephen J Nuagah, **E.A. Affum** (2019). Improved Propagation Models for LTE Path Loss Prediction in Urban & Suburban Ghana. *International Journal of Wireless & Mobile Networks*. https://doi.org/10.5121/ijwmn.2019.11603

22. **Emmanuel Ampoma Affum**, KO Gyasi (2019). Massive MIMO with Transceiver Hardware Impairments: Performance Analysis and Phase Noise Error Minimization. *KSII Transaction on Internet and Information Systems*. https://www.academia.edu/download/88145865/TIISVol13No5-7.pdf

23. **Emmanuel Ampoma Affum** (2018). A Compact Broadband Circularly Polarized Slot Antenna with Two Linked Rectangular Slots and an Inverted-F Feed Line. *IEEE Transactions on Antennas and Propagation*. https://ieeexplore.ieee.org/abstract/document/8445652/

24. **Emmanuel Ampoma Affum** (2018). A Compact Broadband Cross-Shaped Circularly Polarized Planar Monopole Antenna with a Ground Plane Extension. *IEEE Antennas and Wireless Propagation Letters,*. https://ieeexplore.ieee.org/abstract/document/8246568/

25. **Affum Emmanuel Ampoma**, Guangjun Wen, Yongjun Huang, Kwame Oteng Gyasi, Parfait I. Tebe, Kwadwo Ntiamoah-Sarpong (2018). Spatial Correlation Models of Large-Scale Antenna Topologies Using Maximum Power of Offset Distribution and its Application. *IEEE Access*. https://doi.org/10.1109/access.2018.2846260

26. **Emmanuel Ampoma Affum** (2018). Tri-band Planar Monopole Antenna with Two Circularly Polarized Bandwidths for WiMAX Applications. *IET Microwave, Antennas and Propagation*. https://doi.org/10.1049/iet-map.2018.5323

27. **Emmanuel Ampoma Affum** (2017). Broadband circularly polarized cross shaped slot antenna with improved feedline. *Progress in Electromagnetics Research C (PIER C)*. https://www.jpier.org/PIERC/pier.php?paper=17020501

28. **Emmanuel Ampoma Affum** (2017). Broadband circularly polarized square slot antenna with a G-shaped feedline. *Microwave and Optical Technology Letters*. https://doi.org/10.1002/mop.30869

29. **Emmanuel Ampoma Affum** (2017). Channel Inversion Schemes with Compensation Network for Two-Element Compact Array in Multi-User MIMO. *Journal Advances in Science, Technology and Engineering Systems*.

30. **Emmanuel Ampoma Affum** (2017). MIMO Performance and Decoupling Network: "Analysis of Uniform Rectangular Array using Correlated- based Stochastic Models,. *Journal of Advances in Science Technology and Engineering Systems*.

31. **Emmanuel Ampoma Affum**, OG Kwame (2017). Three-Dimensional Spatial Fading Correlation of Uniform Rectangular Array Using Total Power of Angular Distribution. *IEEE Antennas and Wireless Propagation Letters*. https://ieeexplore.ieee.org/abstract/document/7915683/

32. **Emmanuel Ampoma Affum** (2016). Analysis of Compensation Network in a Correlated-based Channel using Angle of Arrivals. *Journal of Advanced Computer Science and Applications*. https://www.academia.edu/download/80327558/d16ff70a2fa96d7cbf4ab0281911ab277f39.pdf

33. **Emmanuel Ampoma Affum**, OG Kwame (2016). Evaluation of SmallReceiving Monopole Array with Decoupling Networksin Massive MIMO System. *Proceedings of the World Congress on Engineering*. http://www.iaeng.org/publication/WCE2016/WCE2016_pp577-582.pdf

34. **E Affum** (2015). Performance Evaluation and Measurement of 3G Moible Communication Networks, A Case Study. *World Journal of Engineering and Technology (WJET)*. https://pdfs.semanticscholar.org/fe66/ceb1309f4d711b374a18eddb7113a0b66b94.pdf

35. Kwame Agyeman-Prempeh Agyekum, Eric T. Tchao, **Emmanuel Affum** (2015). Performance Evaluation and Measurements of 3G Mobile Communication Networks: A Case Study. *World Journal of Engineering and Technology*. https://doi.org/10.4236/wjet.2015.34018

36. **Emmanuel Ampoma Affum**, ED Ansong (2014). Evaluate the Quality of Service of Airtel Mobile Network on Knust Campus. *Asian Journal of Current Engineering and Maths*. http://informaciontechnologica.com/index.php/ajcem/article/view/567

37. KAP Agyekum, Eric T. Tchao, **Emmanuel Affum** (2014). Quality of Service Evaluation of a Deployed 3G

Data Network for a Campus wide e-Learning Platform. *International Journal of Computer Applications*. https://doi.org/10.5120/15964-5263

38. **A Emmanuel** (2013). A Study of the readiness of the African Telecommunication industry to upgrade all GSM base stations LTE. Case Study – Ghana. *Journal of Telecommunications,*.

39. E. T., K. Diawuo, W.K. Ofosu, **E. Affum** (2013). Analysis of MIMO Systems used in planning a 4G-WiMAX Network in Ghana. *International Journal of Advanced Computer Science and Applications*. https://doi.org/10.14569/ijacsa.2013.040728

40. **Emmanuel Ampoma Affum**, ET Tchao (2013). Customer experience with mobile number portability implementation in ghana. *International Journal of Emerging Technology and Advanced Engineering*. https://www.academia.edu/download/43261876/Customer_Experience_with_Mobile_Number_P20160302-17441-qosubs.pdf

41. **Emmanuel Ampoma Affum** (2013). Evaluation of Mobile Number Portability in Ghana. *International Journal of Computer Science and Telecommunications (IJCST),*.

42. KAP Agyekum, ET Tchao, **E Affum** (2013). Evaluation of mobile number portability implementation in Ghana. *International Journal of Computer Science and Telecommunications*. https://www.researchgate.net/profile/E-T-Tchao/publication/258949086_Evaluation_of_Mobile_Number_Portability_Implementation_in_Ghana/links/00b495297ea3213eb6000000/Evaluation-of-Mobile-Number-Portability-Implementation-in-Ghana.pdf

43. **Emmanuel Ampoma Affum** (2013). Interference Simulation and Measurement for a Deployed 4G-WIMAX Network in an Urban Sub-Saharan African Environment. *International Conference on Wireless Networks*, *International Journal of Computer Application*.

44. E. T.Tchao, W. K. Ofosu, K. Diawuo, **E. Affum**, Kwame Agyekum (2013). Interference Simulation and Measurements for a Deployed 4G-WiMAX Network in an Urban Sub-Saharan African Environment. *International Journal of Computer Applications*. https://doi.org/10.5120/12424-8973

45. **A Emmanuel** (2013). On Comparism Analysis of Multiple Interference MIMO system with Un correlated Rician Fading Channels. *International Journal of Computer Application*.

46. **E. Affum**, E.T. Tchao, K. Diawuo, K. Agyekum (2013). Wideband Parameters Analysis and Validation for Indoor radio Channel at 60/70/80GHz for Gigabit Wireless Communication employing Isotropic, Horn and Omni directional Antenna. *International Journal of Advanced Computer Science and Applications*. https://doi.org/10.14569/ijacsa.2013.040638

47. **E Affum** (2012). The challenges of young ICT entrepreneur in developing countries: Case study–Ghana. *International Journal of Computer Application,*.

48. **Emmanuel Ampoma Affum**, E Ansong (2011). Propagation Assessment of MB- OFDM Ultrawide Band (UWB) MIMO Based Communication in Fading Channels. *International Journal of Computer Engineering Science*.

Conference papers 9

1. **Emmanuel Ampoma Affum**, Osumanu Futa, Oscar Famous Darteh, Benjamin Addo-Mensah, Azingya Cosmos (2025). Optimizing Channel Feedback Using Lloyd Algorithm-Based AoD-Adaptive Subspace Codebook for 5G FDD Massive MIMO. https://doi.org/10.1109/bts-i2c67944.2025.11399378

2. **Emmanuel Ampoma Affum**, Matthew O. Adigun, Kofi Anane Boateng, Sunday Adeola Ajagbe, Emmanuel Addo (2022). Enhancing UAV Communication Performance: Analysis Using Interference Based Geometry Stochastic Model and Successive Interference Cancellation. *Lecture notes in computer science*. https://doi.org/10.1007/978-3-031-10522-7_17

3. **E. A. Affum**, S. A. Ajagbe, K. A. Boateng, M. O. Adigun, E. Addo (2022). Response Analysis of Varied Q-Power Values of Cosine Distribution In Spatial Correlation. *2022 IEEE International Symposium on Antennas and Propagation and USNC-URSI Radio Science Meeting (AP-S/URSI)*. https://doi.org/10.1109/ap-s/usnc-ursi47032.2022.9887202

4. DANIEL KUYOLI NGALA, KWASI ADU-BOAHEN OPARE, **EMMANUEL AMPOMA AFFUM** (2019). Performance Analysis of SISO and MIMO Communication Systems using Multiple Point Scatter Model.

https://doi.org/10.1109/icmrsisiit46373.2020.9405822

5. **Emmanuel Ampoma Affum** (2018). Efficient parallelization for big data Collaborative recommendation decisions. *IEEE 8th Annual Computing and Communication Workshop and Conference (CCWC*. https://ieeexplore.ieee.org/abstract/document/8301706/
6. **Emmanuel Ampoma Affum** (2016). Antenna selection with decoupling network for small receiving monopole array in a correlated MIMO system. *IEEE International Conference on Ubiquitous and Future Networks (ICUFN)*. https://ieeexplore.ieee.org/abstract/document/7537049/
7. **Emmanuel Ampoma Affum** (2016). Evaluation of Small Receiving Monopole Array with Decoupling Networks in Massive MIMO. *International Conference of Wireless Networks, World Congress on Engineering (WCE 2016)*.
8. **Emmanuel Ampoma Affum** (2016). Performance of 40, 80 and 112 Gb/s PDM-DQPSK optical label switching system with spectral amplitude code labels. *IEEE Asia- Pacific Conference on Communications (APCC)*,. https://ieeexplore.ieee.org/abstract/document/7581520/
9. **AA Emmanuel** (2009). Model design of non-volatile SRAM based on Magnetic Tunnel Junction. *2009 2nd International Conference on Adaptive Science & Technology (ICAST)*. https://ieeexplore.ieee.org/abstract/document/5409743/