ERIC TUTU TCHAO

Ph.D, Bsc (Hons)

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CONTACT ADDRESS

Ghana

Department of Computer Engineering
Kwame Nkrumah University of Science and Technology
Kumasi, Ghana
e-mail: ettchao.coe@knust.edu.gh
etchao@ictp.it
tutucharmin9@gmail.com
Mobile No.: +233 249979837

BIOGRAPHY

Prof. Eric Tutu Tchao is an Associate Professor in the Department of Computer Engineering at Kwame Nkrumah University of Science and Technology (KNUST), Ghana. As a distinguished researcher and innovation leader, he is deeply committed to leveraging technology for sustainable development in Africa. His research interests include AI for Development (AI4D), Industrial IoT, and blockchain interoperability with a focus on applying these frontier technologies to build resilient, interconnected, and innovative African communities. He serves as the Scientific Director of the Distributed IoT Platforms, Privacy and Edge-Intelligence Research (DIPPER) Lab and leads the Agricultural Innovations and Food Security theme at the Responsible Artificial Intelligence Lab (RAIL). In these roles, he spearheads initiatives that integrate cutting-edge technologies such as Artificial Intelligence, IoT, and blockchain into practical, and scalable solutions that address critical challenges like climate resilience and food security. As a DFG Scholar, Future Africa Research Leadership Fellow, and a TWAS-ENEA Post-Doctoral Research Fellow, he has consistently demonstrated excellence in research and leadership. He is a recipient of the KNUST-MTN Ghana Research Innovation Grant and the Innovate UK's African Agriculture Knowledge Transfer Partnership grant. Dr. Tchao leads activities of the Policy Actions Lab, and also served as part of the Intergovernmental Committee of Experts (ICE) for the United Nations Economic Commission for Africa (UNECA), Central Africa, with a key focus of advising on strategic initiatives to promote digital economic transformation within the Central Africa sub-region. Currently, he leads the Digital Development Technology Research Theme under the KNUST Engineering Education Project (KEEP), further reinforcing his dedication to advancing context-aware technological solutions for African environments. Beyond academia, he actively bridges research with real-world application, collaborating with Agritechs to enhance processes and improve smallholder farmer outcomes through knowledge transfer and innovation commercialization.

ACADEMIC DEGREES EARNED WITH DATES

August 2011 – June 2015	PhD Telecommunications Engineering, Kwame Nkrumah University of Science and Technology, Ghana (KNUST),
August 2006 – June 2010	BSc Telecommunications Engineering, Kwame Nkrumah University of Science and Technology, Ghana

UNIVERSITY TEACHING AND ACADEMIC RANKS HELD

August 2024 – Present	*Associate Professor* - Kwame Nkrumah University of Science and Technology (KNUST)
August 2020 – July 2024	*Senior Lecturer* - Kwame Nkrumah University of Science and Technology (KNUST)

September 2015 – July 2020 *Lecturer* - Kwame Nkrumah University of Science and Technology (KNUST)

October 2011 – Dec 2015 *Researcher* - Kwame Nkrumah University of Science and Technology (KNUST)

Item	Role
1.	**Sectional Head**, Information Science and Systems Engineering
2.	**Coordinator**, Dept Postgraduate Programmes (Aug 2020 - 2021)
3.	**Coordinator**, Department Student Projects (Jan 2021 – 2022)
4.	**Coordinator**, Faculty Grants and Research Collaboration (August 2020 - 2022)
5.	**Chairman**, Department Postgraduate Committee
6.	**Chairman**, Dept Partnership/MoU Committee (Aug 2020 – 2022)
7.	**Membe**r, Dept Curriculum Review Committee (August 2020)
8.	**Membe**r, Department of Computer Eng. Lab Equipment Committee
9.	**Membe**r, Committee to Review Departmental Exchange and Fellowship Programmes
10.	**Theme Lead**, Digital Development Technologies for KNUST Engineering Education Project (Oct 2020 – Current)
11.	**Membe**r of Committee to Draft Proposal for the Establishment of Competence in Digital Education (Oct 2020)
12.	**Membe**r, Technology Innovation Week Committee
13.	**Academic Tutor** for ED 1 - COE, Computer Engineering Department
14.	**Member**, 1Deparment, 1 Start-up Committee (2020) - COE
15.	**Member**, KNUST Council of Convocation (2020-2021)
16.	**Membe**r, CAPC Sub-Committee for Senior Staff
17.	**Policy Champion**, KNUST
18.	**Member,** UTAG Vehicle Purchase Committee
19.	**IDL Coordinator,** Department of Computer Engineering
20.	**Reviewer**, KNUST Research Fund (KReF) Applications (Feb 2021)
21.	**Member,** Independence Hall JCR Business challenge
22.	**Member**, UTAG-KNUST Bed allocation application for Lecturers
23.	**Chairman**, Grant and Research Coordinating Committee - FECE
24.	**Chairman**, Committee to Review GCTU's BSc. Mobile Computing Programme
25.	**Panel Member,** Ghana Digital Innovation Week 2023
26.	**Moderator**, Ghana Communications Technology University
27.	**Steering Committee member**, Market Entry into Renewable Energy (RE) and Energy Efficiency (EE) for the Productive Sector in Ghana.
28.	**Reviewer**, The Science and Information Society - International Journal of Advanced Computer Science and Applications (IJACSA)
29.	**Examiner,** West Africa Examinations Council, 2020
30.	**Technical Panel Committee Member**, IEEE Wireless Telecommunication Symposium (WTS) 2021
31.	**High Level Panel Member**, The United Nations Economic Commission for Africa Ad Hoc Meeting of Experts (Dec 2020, Cameroon)
32.	**Visiting Scholar** at iVESK, Offenburg University, TWAS-DFG Cooperation Visits Programme
33.	**Member**, Planning Committee for International Telecommunication Union's World Telecom Development Conference, Addis Ababa, Ethiopia 2021

RESEARCH LEADERSHIP POSITION

Jan 2021- Present	*Scientific Director* - Distributed IoT Platforms, Privacy and Edge-Intelligence Research (DIPPER) Lab (dipperlab.knust.edu.gh)
Nov 2021 – Present	*Research Theme Lead* - Responsible Artificial Intelligence Lab (rail.knust.edu.gh)

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1. Details of Selected Research and Projects Undertaken

August 2020 – June 2022	**Digital Diagnostics for Smarter Healthcare in Africa** - A £149,967.00 network grant by the UK Research and Innovation's Digital Innovation for Development in Africa (DIDA) Initiative.
	Yebanbo - Supporting Victims of Intimate Partner Violence using an AI-Enabled Toolbox – Gender AT Works – $25,000.00 Canadian Dollars.
Nov 2024 - Oct 2025	**Developing of Smart Precision Agric Toolboxes** – Artificial Intelligence for Sustainable Development Project, French Embassy in Ghana – €1.03 million
2022 - 2023	**DOTbox** – Development of an Open Toolbox for Safe Food Monitoring project funded by the Future Africa Research Leadership (FAR-LeaF), Carnegie grant – $32,000
	Adoption of digital tools by African farmers for sustainable intensification of cropping systems, DFG, German Research Foundation - € 19,544.00
2021 - 2024	Joint **DAAD-BMBF R&D Grant** - Distributed IoT-Platforms for Safe Food Production – in Education, Research and Industry (Dipper) - 718,915.87 Euros
	AI4CARDIO and Digital Diagnostics Research under the Regional Artificial Intelligence Lab (RAIL-KNUST) - Joint IDRC-GIZ Grant of $1,013,167.00 Canadian Dollars
2023 - 2024	African Agriculture Knowledge Transfer Partnership Grant with SESI Technologies, UKRI – £248,162.00
August 2025 – Dec 2025	**FarmSense** Commercialization and Capacity Building Project, FCDO grant under the RISA programme – $70,000
August 2023 – July 2026	Student and Staff Mobility Grant with Scuola Superiore Sant'Anna, Italy, Erasmus+ Grant – €1.6 Million

2. Policy and Advocacy

August 2025 – March 2026	Lead Converner - Policy Action Lab, a joint digital economic transformation policy and advocacy intiative between The DIPPER Lab, African Centre for Digital Transformation and the Internet Society Ghana Chapter
June 2025 – July 2025	Expert Policy Analyst – National AI Strategy for Ghana, funded by GIZ
Sept 2019 – December 2020	Intergovenrment Committee of Expert (ICE) – United Nations Economic Commission for Africa (UNECA), Central Africa

3. Selected Publications arising out of research

1. Seth Djanie Kotey, Eric Tutu Tchao, Abdul-Rahman Ahmed, Andrew Selasi Agbemenu, Eliel Keelson, and Eliel Keelson, *A Framework for Full Decentralization in Blockchain Interoperability*. Sensors, Dec 2024, 24, 7630. https://doi.org/10.3390/s24237630
2. Seth Djanie Kotey, Eric Tutu Tchao, Abdul-Rahman Ahmed, Axel Sikora, Andrew Selasi Agbemenu, Eliel Keelson, Dominik Welte and Eliel Keelson, " P2Blockchain: A Fully Decentralized Blockchain Interoperability Architecture", Future Generation Computer Systems

3. Robert Antwi, James Dzisi Gadze, **Eric Tutu Tchao**, Axel Sikora, Henry Nunoo-Mensah, Andrew Selasi Agbemenu, Kwame Opuni-Boachie, Justice Owusu Agyemang, Dominik Welte, and Eliel Keelson. " *Optimising peer-to-peer topology for blockchain-based industrial internet of things networks using particle swarm optimisation.* Cluster Computing, 28, 204 (2025). https://doi.org/10.1007/s10586-024-04917-2
4. Jacklingo Anthony Kwame Quansah, Eric Tutu Tchao, Mohammed Al-Khalidi, Andrew Selasi Agbemenu, Prince Odame, Benjamin Kommey, *Poisoning Attacks in Federated Learning Systems for IoT Environments: Challenges, Defense, and Future Directions*, Journal of Computer Information Systems
5. Jacklingo Anthony Kwame Quansah Eliel Keelson, Andrew Selasi Agbemenu, **Eric Tutu Tchao**, Bright Yeboah-Akowuah, "A Hybrid Deep Learning Approach for Detecting DDoS Attacks in IoT Environments Using the CDBi-LSTM Model", IET Communications
6. Emmanuel Asiamah, Eliel Keelson, Andrew Selasi Agbemenu, **Eric Tutu Tchao**, Theresa-Samuelle Adjaidoo, Griffith Selorm Klogo, "*Optimizing Blockchain Querying: A Comprehensive Review of Techniques, Challenges, and Future Directions* ", in IEEE Access, vol. 12, pp. 196282-196305, 2024, doi: 10.1109/ACCESS.2024.3522584.
7. Emmanuel Asiamah, Nana Kwadwo Akrasi Mensah, Prince Odame, Eliel Keelson, Andrew Selasi Agbemenu, **Eric Tutu Tchao**, Mohammed Al Khalidi, Griffith Selorm Klogo, " *A storage-efficient Learned Indexing for Blockchain Systems Using A Sliding Window Search Enhanced Online Gradient Descent*", The Journal of Supercomputing, 81, 321 (2025). https://doi.org/10.1007/s11227-024-06805-3
8. Andrews Tang, **Eric Tutu Tchao**, Andrew Selasi Agbemenu, Eliel Keelson, Griffith Selorm Klogo, Jerry John Kponyo*: Assessing blockchain and IoT technologies for agricultural food supply chains in Africa: A feasibility analysis, Heliyon, Volume 10, Issue 15, e34584 July 2024, DOI:10.1016/j.heliyon.2024.e34584*
9. Andrew Selasi Agbemenu, Andrews Tang, , Elton Gyabeng Modestus, Prince Odame, **Eric Tutu Tchao**, Eliel Keelson, Zinia Zauku Jerry John Kponyo*; AfroPalm - Afrocentric Palm Oil Adulteration Learning Models: An End-to-End Deep Learning Approach for Detection of Palm Oil Adulteration,* LWT – Food Science and Technology. https://doi.org/ 10.1186/s13638-021-02074-3
10. Julius Adinkrah, Francis Kemausuor, **Eric Tutu Tchao**, Henry Nunoo-Mensah, Andrew Selasi Agbemenu, Akwasi Adu-Poku, Jerry John Kponyo*, Artificial intelligence-based strategies for sustainable energy planning and electricity demand estimation: A systematic review,* Renewable and Sustainable Energy Reviews, Volume 210, 2025, 115161, ISSN 1364-0321, https://doi.org/10.1016/j.rser.2024.115161.
11. Prince Odame, Maxwell Mawube Ahiamadzor, Nana Kwaku Baah Derkyi, Kofi Agyekum Boateng, Kelvin Sarfo-Acheampong, Eric Tutu Tchao, Andrew Selasi, Agbemenu, Henry Nunoo-Mensah, Dorothy Araba Yakoba Agyapong, Jerry John Kponyo" *Multi-Wound Classification: Exploring Image Enhancement and Deep Learning Techniques.* Engineering Reports, 7: e70001. https://doi.org/10.1002/eng2.70001
12. Albert Dede, Henry Nunoo-Mensah, Eric Tutu Tchao, Andrew Selasi Agbemenu, Prince Ebenezer Adjei, Francisca Adoma Acheampong, Jerry John Kponyo " Deep Learning for Efficient High-Resolution Image Processing: A Systematic Review. Intelligent Systems with Applications, Volume 26, 2025, 200505, ISSN 2667-3053, https://doi.org/10.1016/j.iswa.2025.200505
13. Amina Salifu, Henry Nunoo-Mensah, H., **Eric Tutu Tchao,** F. Achemapong, Andrew Selasi Agbemenu, J. J. Kponyo. Enhancing speech recognition through diverse shared features accent classification. Int J Speech Technol 28, 461–481 (2025). https://doi.org/10.1007/s10772-025-10198-w
14. Seth Djanie Kotey, **Eric Tutu Tchao**, Abdul-Rahman Ahmed, Axel Sikora, Andrew Selasi Agbemenu, Eliel Keelson, Dominik Welte and Eliel Keelson, "*Blockchain interoperability: the state of heterogenous blockchain-to-blockchain communication*", IET Communications. 00, 1– 24 (March 2023). https://doi.org/10.1049/cmu2.12594
15. Nana Kwadwo Akrasi-Mensah, **Eric Tutu Tchao**, Henry Nunoo-Mensah, Andrew Selasi Agbemenu, Abdul-Rahman Ahmed, Axel Sikora, Dominik Welte and Eliel Keelson, "*An Overview on*

Technologies for Improving Storage Efficiency in Blockchain-Based IIoT Applications" Electronics, 11(16):2513. August 2022, https://doi.org/10.3390/electronics11162513.

16. Nana Kwadwo Akrasi-Mensah, Andrew Selasi Agbemenu, Henry Nunoo-Mensah, **Eric Tutu Tchao**, Abdul-Rahman Ahmed, Eliel Keelson, Axel Sikora, Dominik Welte and Jerry John Kponyo" *An Adaptive Storage Optimization Scheme for Blockchain-IIoT Applications using Deep Reinforcement Learning*", in IEEE Access, vol. 11, pp. 1372-1385, 2023, doi: 10.1109/ACCESS.2022.3233474.
17. Robert Antwi, James Dzisi Gadze, **Eric Tutu Tchao**, Axel Sikora, Henry Nunoo-Mensah, Andrew Selasi Agbemenu, Kwame Opuni-Boachie, Justice Owusu Agyemang, Dominik Welte, and Eliel Keelson. "*A Survey of Network Optimization Techniques for Blockchain Systems*", Algorithm, June 2022; 15(6): pp193. https://doi.org/10.3390/a15060193
18. Clement Nartey, **Eric Tutu Tchao**, James Dzisi Gadze, Eliel Keelson, Griffith Selorm Klogo, Benjamin Kommey, Kwasi Diawuo, "*On Blockchain and IoT Integration Platforms: Current Implementation Challenges and Future Perspectives*", Wireless Communications and Mobile Computing, vol. 2021, Article ID 6672482, 25 pages, April, 2021. https://doi.org/10.1155/2021/6672482
19. Clement Nartey, **Eric Tutu Tchao**, James Dzisi Gadze, Bright Yeboah-Akowuah, Henry Nunoo-Mensah, Dominik Welte, Axel Sikora*: Blockchain-IoT peer device storage optimization using an advanced time-variant multi-objective particle swarm optimization algorithm.* EURASIP J Wireless Com Network, 5(1), Jan 2022. https://doi.org/10.1186/s13638-021-02074-3
20. Kenneth Nsafoa -Yeboah, **Eric Tutu Tchao**, Bright Yeboah-Akowuah, Benjamin Kommey, Eliel Keelson and Mohammad Monirujjaman Khan*: Software Defined Networks for Optical Networks - Advances, Challenges and Opportunities,* Journal of Computer Networks and Communications, vol. 2022, Article ID 5037702, 40 pages, Aug 2022. https://doi.org/10.1155/2022/5037702
21. Kenneth Nsafoa -Yeboah, **Eric Tutu Tchao**, Benjamin Kommey, Andrew Selasi Agbemenu, Griffith Selorm Klogo, and Nana Kwadwo Akrasi-Mensah*: Flexible ONOS Architecture for Implementing Higher Scalability Using Disaggregated SDON*, IET Networks. Dec 2023, https://doi.org/10.1049/ntw2.12110
22. **Eric Tutu Tchao**, David Ato Quansah, Griffith Klogo, Francis Boafo-Effah, Seth Kotey, Clement Nartey, and Willie K. Ofosu*; On Cloud-Based Systems and Distributed Platforms for Smart Grid Integration: Challenges and Prospects for Ghana's Grid Network,* Scientific African, Scientific African, Volume 12, July 2021, e00796, ISSN 2468-2276, *https*://doi.org/10.1016/j.sciaf.2021.e00796
23. Kommey Benjamin, Tamakloe Elvis, Kponyo Jerry, **Eric Tutu Tchao**, Agbemenu Andrew, Nunoo-Mensah Henry; "*An AI-based Non-intrusive Load Monitoring of Energy Consumption in an Electrical Energy System Using a Modified K-Nearest Neighbor (KNN) Algorithm*". IET Smart Cities, Jan 2024 https://doi.org/10.1049/smc2.12075
24. Kommey, B., Boateng, K.O., Yankey, J., Addo, E.O., Agbemenu, A.S., **Tchao, E.T.,** Akowuah, B.Y.: Design of a fully integrated VHF CP-PLL frequency synthesizer with an all-digital defect-oriented built-in self-test. J. Eng. 1–15 (Oct. 2022).https://doi.org/10.1049/tje2.12211
25. Bright Yeboah-Akowuah, **Eric Tutu Tchao**, Mohammad Monirujjaman Khan, Masood Ur-Rehman*; Study of a Printed Split-Ring Monopole for Dual-Spectrum Communications,* Heliyon, Volume 7, Issue 9, e07928, September 2021, e07928, ISSN 2405-8440, https://doi.org/10.1016/j.heliyon.2021.e07928
26. Rachel Adams, Ayantola Alayande, Zameer Brey, Brantley Browning, Michael Gastrow, Jerry John Kponyo, Dona Mathew, Moremi Nkosi, Henry Nunoo-Mensah, Diana Nyakundi, Victor Odumuyiwa, Olubunmi Okunowo, Philipp Olbrich, Nawal Omar, Kemi Omotubora, Paul Plantinga, Gabriella Razzano, Zara Schroeder, Andrew Selasi Agbemenu, Araba Sey, Kristophina Shilongo, Shreya Shirude3, Matthew Smith, **Eric Tutu Tchao**, Davy K. Uwizera; *A New Research Agenda for African Generative AI;* Nature Human Behavior, https://www.nature.com/articles/s41562-023-01735-1
27. Mohammad Monirujjaman Khan, Bright Yeboah-Akowuah, Kaisarul Islam, **Eric Tutu Tchao,** Sumanta Bhattacharyya, Rajesh Dey, Mehedi Masud and Fahad Alraddady. *Novel Design of UWB Jeans Based Textile Antenna for Body-centric Communications*. Computer Systems Science and Engineering, Nov, 2021 https://dx.doi.org/10.32604/csse.2022.022313
28. E. W. Ramde, **E. T. Tchao**, Y. A. K. Fiagbe, J. J. Kponyo and A. S. Atua. *Pilot Low-Cost Concentrating Solar Power Systems Deployment in Sub-Saharan Africa: A Case Study of*

Implementation Challenges. Sustainability, August 2020, 12, 6223. https://doi.org/10.3390/su12156223

29. **E. T. Tchao**, Y. A. K. Fiagbe, A. S. Atua, E. W. Ramde, and J. J. Kponyo. *An Implementation of an Optimized Dual-Axis Solar Tracking Algorithm for Concentrating Solar Power Plants Deployment,* Scientific African, May 2022, e01228, ISSN 2468-2276, https://doi.org/10.1016/j.sciaf.2022.e01228

Conference Proceedings

30. E. T. Tchao, E. M. Gyabeng, A. Tang, J. B. N. Benyin, E. Keelson and J. J. Kponyo, "An Open and Fully Decentralised Platform for Safe Food Traceability," *2022 International Conference on Computational Science and Computational Intelligence (CSCI)*, Las Vegas, NV, USA, Dec 2022, pp. 487-493, doi: 10.1109/CSCI58124.2022.00092.

31. M. M. Khan, A. Bari, M. Rasheduzzaman, R. H. Ashique, B. Yeboah-Akowuah and **Eric Tutu Tchao**, Q Slot Terahertz (THz) Novel Antenna Design for Wireless Communication, 2021 12th International Conference on Computing Communication and Networking Technologies (ICCCNT), July 2021, pp. 1-5, doi: 10.1109/ICCCNT51525.2021.9579558.