DR. AARON M. OIRERE

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P.O. Box 7320 Eldoret, Kenya

Profile:

- *Google sholar profile*
- *Research gate profile*
- *ORCID profile*

PROFESSIONAL SUMMARY

Senior Lecturer, researcher, and academic leader with over a decade of experience in Computer Science, specializing in Artificial Intelligence, Natural Language Processing, Data Analytics, and Deep Learning. Track record in university teaching, postgraduate supervision, departmental leadership, and high-impact research, with numerous peer-reviewed publications, patents, and funded research projects. Recognized for advancing innovative computing solutions, mentoring graduate students to completion, and contributing to institutional growth through curriculum development, research leadership, and international collaboration.

TECHNICAL SKILLS

- Artificial Intelligence (AI)
- Natural Language Processing (NLP)
- Information Retrieval (IR)
- Data Analytics
- Internet of Things (IoT)
- Human-Computer Interface (HCI)
- Computer Hardware
- Networking
- System Architecture
- Cybersecurity
- Object-Oriented Software:
- Medical Image Processing
- Machine Learning Algorithms
- Big Data Management

EDUCATION

Ph.D. in Computer Science *2016*
- Dr. Babasaheb Ambedkar Marathwada University, Maharashtra, India

Master of Science (M.Sc.) in Computer Science *2008 – 2010*
- Bharathiar University, Coimbatore, Tamilnadu, India

Diploma in Hardware A+ & Diploma in Networking N+ *2008*
- Indian Institute of Hardware Technology (IIHT)

Bachelor of Science (B.Sc.) in Computer Science *2004 – 2007*
- Periyar University, Salem, Tamilnadu, India

Kenya Certificate of Secondary Education (KCSE) *2003*
- Kaptumo High School, Kenya

TEACHING EXPERIENCE

Current Positions

- *Senior Lecturer:* Murang'a University of Technology (September 2025 – Present).
- *Chairman of Department (CoD):* Department of Computer Science, Murang'a University of Technology (2018 – Present).

Previous Academic Experience

- *Lecturer:* Murang'a University of Technology (February 2018 – July 2025).
- *Dean, School of Pure and Applied Sciences:* Kirinyaga University (2017 – March 2018).
- *Lecturer***:** Kirinyaga University (September 2016 – February 2018).
- *Lecturer:* Department of Mass Communications, Dr. Babasaheb Ambedkar Marathwada University, India (June 2013 – August 2015).

- ***Part-time Lecturer (2015 – 2016):*** Held various roles at the following institutions:
  - Jomo Kenyatta University of Agriculture and Technology (JKUAT), Eldoret Branch.
  - Rongo University of Agriculture and Technology.
  - Catholic University, Eldoret Branch.
  - Mount Kenya University, Kisumu Branch.

INTELLECTUAL PROPERTY - PATENT

- Patent number: 562306 under section 43(2): **Method, apparatus and system for virtualized, diskless computing system for educational applications and research** – intellectual property India – http://ipindia.nic.in/index.htm, publication date (u/s 11A): 07/12/2018, date of certificate issue:11/03/2025

JOURNAL PUBLICATIONS

- Vincent Mbandu Ochango Geoffrey M. Wambugu and **Aaron M. Oirere** (2025), ***"Comparative Analysis of Deep Learning Models for Crop Diseases and Pest Classification"***, International Journal of Formal Sciences: Current and Future Research Trends (IJFSCFRT) ISSN: 2790-7945 https://ijfscfrtjournal.isrra.org/index.php/Formal_Sciences_Journal/index

- Jackson Kamiri, Geoffrey Mariga Wambugu and **Aaron Mogeni Oirere** (2025) ***"An Empirical Analysis of Encoder-Decoder (U-Net) Variants for Medical Image Segmentation"*** International Journal of Scientific Research in Computer Science and Engineering Vol.13, Issue.1, pp.26-31, E-ISSN: 2320-7639 Available online at: www.isroset.org

- Millicent K. Murithi, **Aaron M. Oirere** and Rachael N. Ndung'u, (2025) ***" Empirical Analysis of the State-of-the-Art Models for Handling Polarity Shifts Due to Implicit Negation in Mobile Phone Reviews"*** International Journal of Computing Sciences Research (ISSN print: 2546-0552; ISSN online: 2546-115X)Vol. 9, pp.3392-3417doi: 10.25147/ijcsr.2017.001.1.224 https://stepacademic.net

- Millicent K. Murithi , **Aaron M. Oirere** and Rachael N. Ndung'u (2017), ***"A Systematic Review of the Sentiment Analysis Models Used in Handling Polarity Shift"*** , International Journal of Computing Sciences Research (ISSN print: 2546-0552; ISSN online: 2546- 115X) Vol. 8, pp. 2635-2676 doi: 10.25147/ijcsr001.1.179 https://stepacademic.net

- Tirus Muya Maina , **Aaron Mogeni Oirere** , Stephen Kahara, (2024) ***"A CNN-Based Digraph Extraction Model for Enhanced Swahili Natural Language Processing"*** International Journal of Scientific Research in Computer Science and Engineering Vol.12, Issue.6, pp.41-51, E-ISSN: 2320-7639 Available online at: www.isroset.org

- Vincent Mbandu Ochango, Geoffrey M. Wambugu and **Aaron M. Oirere** (2024), ***"Deep Learning Model for Crop Diseases and Pest Classification"***, International Journal of Computer and Information Technology (ISSN: 2279 – 0764) Volume 13– Issue 4

- Fredrick Ng'ang'a Njung'e, **Aaron Mogeni Oirere**, Rachael Njeri Ndung'u, (2024) ***"A Comparative Study of Transformer-based Models for Hate-Speech Detection in EnglishKiswahili Code-Switched Social Media Text"*** , International Journal of Advanced Trends in Computer Science and Engineering, 13(5), , 181 - 186 Volume 13, No.5, ISSN 2278- 3091, September – October 2024 Available Online at http://www.warse.org/IJATCSE/static/pdf/file/ijatcse011352024.pdf https://doi.org/10.30534/ijatcse/2024/011352024

- Charles Munyao Muia , **Aaron Mogeni Oirere** , Rachael Njeri Ndung'u,(2024) ***"A Comparative Study of Transformer-based Models for Text Summarization of News Articles"***, International Journal of Advanced Trends in Computer Science and Engineering, volume 13, No. 2, March- April 2024, ISSN 2278-3091, pg 37-43, https://doi.org/10.30534/ijatcse/2024/011322024

- Wanjau, Stephen Kahara, Wambugu, Geoffrey Mariga, **Aaron Mogeni Oirere**, Muketha, Geoffrey Muchiri, (2024) *"Discriminative spatial-temporal feature learning for modeling network intrusion detection systems"*, Journal of Computer Security, vol. 32, no. 1, pp. 1-30, 2024, 10.3233/JCS-220031

- Wanjau, Stephen & Wambugu, Geoffrey & **Aaron Mogeni Oirere**. (2023). *Evaluating Linear and Non-Linear Dimensionality Reduction Approaches for Deep Learning-based Network Intrusion Detection Systems*. International Journal of Wireless and Microwave Technologies. 13. 35-46. 10.5815/ijwmt.2023.04.05

- Jackson Kamiri , Geoffrey Mariga Wambugu, **Aaron Mogeni Oirere**, (2022) *"A Comparative Study of Deep Learning and Transfer Learning in Detection of Diabetic Retinopathy "* International Journal of Computer Applications Technology and Research Volume 11–Issue 07, 247-254, ISSN:-2319–8656 DOI:10.7753/IJCATR1107.1001 www.ijcat.com 247

- Stephen Kahara Wanjau, Geoffrey Mariga Wambugu, **Aaron Mogeni Oirere**, June (2022) *"Network Intrusion Detection Systems: A Systematic Literature Review of Hybrid Deep Learning Approaches"* International Journal of Emerging Science and Engineering (IJESE) ISSN: 2319–6378 (Online), Volume-10 Issue-7, 1 Published By: Blue Eyes Intelligence Engineering and Sciences Publication (BEIESP) © Copyright: All rights reserved. Retrieval Number: 100.1/ijese.F25300510622 DOI: 10.35940/ijese.F2530.0610722 Journal Website: www.ijese.org

- Jackson Kamiri, Geoffrey Mariga and **Aaron Oirere** (2022) *"A Systematic Literature Review of Meta-Learning Models for Classification Tasks"* International Journal of Computer Applications Technology and Research Volume 11–Issue 03, 56-65, ISSN:- 2319–8656 DOI:10.7753/IJCATR1103.1002

- George Mwangi Muhindi, Geoffrey Mariga Wambugu and **Aaron M. Oirere**, (2021) INTELLECTUAL PROPERTY - PATENT JOURNAL PUBLICATIONS*: "Detection of Visual similarity snoop attacks in email using an extended client based technique"*, International Journal of Engineering and Advanced Technology(IJEAT) ISSN: 22 49-8958,vol 10, issue 4

- James M Mburu, Geoffrey M Muketha and **Aaron M. Oirere** (2020)*"An Enhanced Multiview Test Case Generation Technique for Object-Oriented Software using Class and Activity Diagrams",* International Journal of recent Technology and Engineering (IJRTE) ISSN: 2277-3878 Vol 9 issue 4

- George Mwangi Muhindi, Geoffrey Mariga Wambugu and **Aaron M. Oirere**, (2020) *"A LiteratureSurvey of Visual Similarity Snooping Attacks in Emails"* , International Journal of Scientific Research and innovative Technology (IJSRIT) ISSN:2313-3759

- Jackson Kamiri, Geoffrey M. Wambugu and **Aaron M. Oirere**, (2017)*"Multi-task Deep Learning in Medical Image Processing: A Systematic Review"*International Journal of Computing Sciences Research (ISSN print: 2546-0552; ISSN online: 2546-115X) Vol. 9, pp. 3418-3440 doi: 10.25147/ijcsr.001.1.226 https://stepacademic.net Short Paper

- Devyani S. Kulkarni1, Ratnadeep R. Deshmukh1, Vandana L. Jadhav Patil, Pukhraj P. Shrishrimal1 ,Swapnil D. Waghmare1, **Aaron M. Oirere** (2016), *"Marathi Isolated Digit Recognition System using HTK"* International Conference on Cognitive Knowledge Engineering, International Journal of ComputerApplications (0975 – 8887)

- **Aaron M. Oirere**, Ganesh B. Janvale and Ratnadeep R. Deshmukh, (2015) *"Automatic Speech Recognition and Verification using LPC, MFCC and SVM "* International Journal of Computer Applications (0975 – 8887) Volume 127 – No.8

- **Aaron M. Oirere**, Ratnadeep R. Deshmukh and Pukhraj P. Shrishrimal, (2013) *"Development of isolated numeric spe*ech corpus for Swahili language for development of automatic speech recognition system", International Journal of Computer Applications, 74 (11), 20-22
- **Aaron M. Oirere**, Ratnadeep R. Deshmukh, Pukhraj P. Shrishrimal and Vishal B. Waghmare, (2012), *"Swahili text and speech corpus: a review"*, Asian Journal of Computer Science and Information Technology, 2(11) 286- 290

CONFERENCES PRESENTATIONS

- Ochango, V. M., Wambugu, G. M., **Oirere, A. M.** (Murang'a University of Technology, Kenya). *A Hybrid Deep Learning Model for Crop Diseases and Pest Classification*. Kirinyaga University 8th annual international conference, March 26- 27, 2025
- Mboya, F. M., Wambugu, Geoffrey Mariga, **Aaron M. Oirere**, Omuya, E. O., Musyoka, F. M., Gikandi, J. W. (Muranga University of Science and Technology, Kenya). *A Framework for Enhancing Personalized Learning of Computer Programming Using Large Language Models*. Kirinyaga University 8th annual international conference, March 26-27, 2025
- Stephen Wanjau1 , Geoffrey Wambugu and **Aaron Oirere** *"Empirical Evaluation of Adaptive Optimization on the Generalization Performance of Convolutional Neural Networks"* Proceedings of the Kabarak University International Conference On Computing And Information Systems, 4th - 8th October 2021 Nakuru, Kenya
- **Aaron M Oirere** *"Automatic Speech Recognition Challenges and opportunities"*, International conference on media in south Asia and Arabic World: Challenges & opportunities, Dr. Babasaheb Ambedkar Marathwada University. April, 30th 2017
- **Aaron M Oirere** *"Automatic Speech Recognition and its Application" in international conference on "Interface of Information Technology"* organised by PDVVF's Institute of Business Management & Rural Development, Ahmednagar under the Quality improvement programof university of Pune, September 23 -25, 2013
- Aaron M. Oirere, Vishal B. Waghmare, Ganesh B. Janvale and Ratnadeep R. Deshmukh, *"Designing and development of speech database - the technical review"*, IEEE international conference on knowledge engineering (ICKE-2011) at Dr. Babasaheb Ambedkar Marathwada University, January 31, 2011
- Ratnadeep R. Deshmukh, Ganesh B. Janvale, **Aaron M. Oirere** and Vishal B. Waghmare *"Designing of new proposed technique for lie detection using EEG signal"*, National Conference on Computational Neuroscience, March 10-12, 2011

CONFERENCES AND WORKSHOPS ATTENDED

- **8 th ISDSI International conference**, Pune, Maharashtra (India) held January 2- 4 , 2015 at Hyatt Regency.
- 2 nd International conference on **ICT for Rural Development** held on 1st to 3rd November 2014 at PDVVPF's Institute of Business Management & Rural Development Ahmednagar.India.
- 10 Days workshop on **Automatic Speech Recognition and Synthesis (ASR-2014)**, Sponsored by TEQIP and organised by Research and Training Unit for Navigation Electronics and Department of ECE, Osmania University, Hyderabad (India) held during June 13-22, 2014.
- 1st International conference on **Interface of Information Technology** held on 23rd to 25th September 2013 at PDVVPF's Institute of Business Management & Rural Development Ahmednagar, India.

- Workshop on **Speech Signal Processing** organised by Department of Electronic and communication Engineering Sponsored by TEQIP Phase-II during 10th to 12 May 2013.
- Workshop on **integrating GeoSpatial Technology with-Governance of Indian District (IGST-2013)** organised by Department of Computer Science & IT, Dr. Babasaheb Ambedkar Marathwada University, Aurangabad on January 19, 2013.

SUPERVISION: 9 COMPLETED, 1 ONGOING

1. **James Wachira Kinyua,** Masters of Science in Information Technology, *"DEVELOPING A BIAS SENSITIVE LOAN CLASSIFICATION MODEL BASED ON MACHINE LEARNING ALGORITHMS"* Murang'a University of Technology (Ongoing).

2. **Fredrick Muema Mboya,** Masters of Information technology, *"A LARGE LANGUAGE MODEL BASED FRAMEWORK FOR ENHANCING PERSONALIZED LEARNING OF COMPUTER PROGRAMMING,* Murang'a University of Technology (Completed -2025).

3. **Fredrick Ng'ang'a Njung'e**, Masters in Information Technology, ***"A TRANSFORMERBASED MODEL FOR HATE SPEECH DETECTION IN ENGLISH- KISWAHILI CODE-SWITCHED SOCIAL MEDIA TEXT",*** Murang'a University of Technology (Completed -2025)

4. **Tirus Muya Maina,** PhD in Computer Science, *OPTIMIZING SWAHILI DIGRAPH RECOGNITION USING A FEATURE VECTOR REDUCTION MODEL EMPLOYING MULTINOMIAL LOGISTIC REGRESSION* (Completed -2025)

5. **Millicent Kathambi Murithi,** PhD in Information Technology, *AN OPTIMIZED FEATURE SELECTION MODEL FOR HANDLING POLARITY SHIFT OF MOBILE PHONE BRANDS REVIEWS IN SENTIMENT ANALYSIS USING A GATED RECURRENT UNIT AND AN AUTOENCODER* Murang'a University of Technology (Completed - 2025).

6. Charles Munyao, Masters of Science in Computer Science, "*AN IMPROVED TRANSFORMER-BASED MODEL FOR TEXT SUMMARIZATION OF NEWS ARTICLES"*, Murang'a University of Technology (completed 2024).

7. **Stephen Kahara Wanjau, PhD, in Computer Science,** *"A HYBRID DEEP LEARNING BASED BRUTEFORCE ATTACK DETECTION MOEL IN LARGE AND HIGHSPEED NETWORKS"*,Muranga University of Technology (completed -2023).

8. **Jackson Kmairi Wambugu,** Masters of Science in Information Technology, *"A TRANSFER LEARNING AND TWO-LEVEL HYPERPARAMETER OPTIMIZATION BASED MODEL FOR IMPROVED CLASSIFICATION OF DIABETIC RETINOPATHY"* Murang'a University of Technology (completed - 2022).

9. **James Maina Mburu**, Masters of Science in Information *"AN ENHANCED MULTIVIEW TEST CASEGENERATION TECHNIQUE FOR OBJECT ORIENTED SOFTWARE USING CLASS AND ACTIVITY DIAGRAMS"* Muranga University of Technology (completed - 2021).

10. **George Mwangi Muhindi**, Masters of Science in Information Technology *"DETECTION OF VISUAL SIMILARITY SNOOPING ATTACKS IN EMAILS USING AN EXTENDED CLIENT BASED TECHNIQUE"* Muranga University of Technology (completed -2021).

INTERNAL AND EXTERNAL EXAMINER

1. **SHIJU.N.P,** TITLE : **MULTI BIOMETRIC SYSTEM USING IMAGE PROCESSING ALGORITHMS WITH IMPROVED FUSION METHOD**, PhD In Computer Science, Bharathiar University, India, 2024

2. **C. THAVAMANI, TITLE: MINING SCALABLE MULTIDIMENSIONAL SEQUENTIAL PATTERNS FROM WEB SERVER LOGS FOR THE EFFICIENT PREDICTION OF USER'S REQUES**, PhD in Computer Science, Bharathiar University, India, 2023

3. **Mwangi Ephantus Gichuki**, TITLE: **TRUST-BASED RESILIENT COOPERATIVE BAIT DETECTION TECHNIQUE TO CURB BLACK HOLE ATTACKS IN MOBILE AD HOC NETWORK**, PhD in Information Technology, Murang'a University of Technology, 2021

4. **Rachael Njeri Ndung'u,** TITLE: H**YBRID RECOMMENDER MODEL USING NAÏVE BAYE CLASSIER AND ASSOCIATION RULE MINING FOR MOBILE MARKETPLACE APPLICATIONS**, PhD in Information Technology, Murang'a University of Technology, 2021.

5. **Petronilla Mutwiwa**, TITLE: **ADOPTION FRAMEWORK FOR "BRING YOUR OWN DEVICE" CONCEPT IN INSTITUTIONS OF HIGHER LEARNING: A CASE OF PUBLIC PRIMARY TEACHER COLLEGE IN KENYA**, Masters in Information Technology, Mount Kenya University, 2016

JOURNAL REVIEWER

1. **Kamau, Gabriel Macharia;** IRCS-D-18-00065R1, *"INCREASING VESSEL IMPERCEPTIBILITY AND ROBUSTNESS IN THE BIT PLANE COMPLEXITY SEGMENTATION STEGANOGRAPHY",* Iran Journal of Computer Science (IRCS) 2019

2. **Victor Mageto**, Title: *Facial Expression Recognition based on Fusion Inherited Network*, Indian journal of science and Technology, 2020

PEER REVIEWING

1. **Reviewer**, Iran Journal of Computer Science (IRCS)

2. **Reviewer**, Journal of Applied Sciences

3. **Reviewer**, Indian journal of science and Technology (IJST)

RESEARCH GRANT

- Kenya Education Network (KENET) Research Grant of One Million, five hundred thousand Kenya shillings (ksh 1,500,000) under theme Engineering solution in Climate Change Migration (ESCC), Research grant Topic: **Digital Twin and Internet of Things Technologies for Sustainable Precision Maize Production in Kenya (DIGI-PreM)** (Ongoing)

CLUBS AND SOCIETIES

- **Patron**: Project Management Club – PMI Kenya
- **Patron**: AJIRA Club

MEMBERSHIP TO PROFESSIONAL BODIES

1. Computer Society of Kenya (CSK): **144734**

2. Association of Computing Professionals, Kenya (ACPK): **PM000606**

3. Academic Business Current Data (ABCD): **000-516-994**

POSITIONS OF RESPONSIBILITY HELD

- **CoD, Computer Science,** Murang'a University of Technology, ongoing.
- **Dean, School of Pure and Applied Sciences,** Kirinyaga University (2017- 2018 March)
- **Editor in Chief** - All India African Adventist Student Association (AIAASA), 2012-2013.
- **President** - All India African Adventist Student Association (AIAASA), 2011-2012
- **Vice President** - All India African Adventist Student Association (AIAASA),2009- 2010.

KEY ACHIEVEMENTS

1. **Granted Indian Patent:** Successfully patented a "Method, apparatus and system for virtualized, diskless computing system for educational applications and research" (Patent number: 562306, granted March 11, 2025).
2. **Chairman of Department:** Currently serving as the Chairman of the Department of Computer Science at Murang'a University of Technology (2018–Present).
3. **University Dean:** Served as the Dean of the School of Pure and Applied Sciences at Kirinyaga University (2017–2018).
4. **Senior Faculty Status:** Promoted to the rank of Senior Lecturer at Murang'a University of Technology in September 2025.
5. **Major Research Grant:** Principal Investigator for a Kenya Education Network (KENET) research grant valued at **Ksh 1,500,000** for a project on "Digital Twin and Internet of Things Technologies for Sustainable Precision Maize Production in Kenya".
6. **Extensive Publication Record:** Authored or co-authored over 20 peer-reviewed journal articles and conference papers, focusing on AI, NLP, and Cybersecurity.
7. **Postgraduate Mentorship:** Successfully supervised 9 postgraduate students to completion, including 3 PhD candidates and 6 Master's students.

STRENGTHS AND INTERESTS

Strengths

- Academic Leadership
- Research & Innovation
- Postgraduate Mentorship
- Global Academic Contribution
- Grant Acquisition
- Collaborative Team Player

Interests

- Technology Trends
- Physical Wellness
- Community Service
- Artificial Intelligence & Machine Learning
- Computational Linguistics & NLP
- Cybersecurity

REFEREES

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DECLARATION

"I hereby declare that the information given above is true to the best of my knowledge and belief and do promise to serve anywhere in the globe with diligence, dignity and faithfulness in all duties that shall be assigned to me."

Dr. AARON M. OIRERE