Dr. Dominic Makaa Kitavi, Ph.D.
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Date of Birth: 12th March, 1987.

EDUCATION

Ph.D. in Applied Mathematics, Hong Kong Polytechnic University, Hong Kong, China, 2017.

M.Sc. in Mathematical Sciences (Distinction), University of the Western Cape, South Africa, 2013.

B.Sc. in Mathematics (First-Class Honours), University of Nairobi, Kenya, 2011

Kenya Certificate of Secondary Education (KCSE), A – (minus), 2005.

WORK EXPERIENCE

Senior Lecturer, University of Embu, Kenya (Jan. 2022 - Present).

Lecturer, University of Embu, Kenya (Sep. 2017 – Dec. 2021).

Assistant Lecturer, Mount Kenya University, Kenya (Jan. 2014 – Aug. 2014).

ADMINISTRATIVE RESPONSIBILITIES

Chairman, Department of Mathematics and Statistics, University of Embu (Jul. 2021 – Jul. 2025)

- Served as the Academic and Administrative Head of the Department; Ensured that proper and acceptable standards of teaching, examinations, and research are maintained in the department; Oversaw implementation of university policies in the department.

Departmental Examinations Coordinator, University of Embu (Jan. 2021 – Jul. 2021)

- Ensured that all course assessments in the department were carried out in accordance to the examination policies in operation; Prepared and compiled departmental examination results; Dealt with all matters arising from students in relation to examinations and examination results at the departmental level.

RESEARCH APPOINTMENTS

Senior Postdoctoral Research Fellow, De La Salle University, Philippines (Apr. 2025 – Present)

- Advanced Research Institute for Informatics, Computing and Networking (AdRIC).

Visiting Scholar, National Taipei University, Taiwan (Jun. 2024 – Aug. 2024)

- Department of Statistics, College of Business.

OTHER APPOINTMENTS

External Examiner, Tom Mboya University, Kenya (Jul. 2024 – Present)

- Faculty of Biological and Physical Sciences.
- Duties: Assessing the university's quality of examination drafts, ensuring marking of the examinations meets high integrity standards, and guiding on examination related matters.

Board Member, Kaliku Secondary School (2024–Present) & Endau Secondary School (2019–2025)

- Strategic decision-making, governance oversight, and community engagement.

GRANTS

	Grant Number	Grant Source	Amount	Period
1.	113-2912-I-305-501	National Science and Technology Council, Taiwan	NT$ 50,908	May 2024 to Sep. 2024
2.	NTPU113-Chen-Chong-Ku	The Business College, National Taipei University	NT$ 172,110	May 2024 to Sep. 2024

PUBLICATIONS

SELECTED JOURNAL PAPERS

1. J. T. Maina, G. W. Gachigua, **D. M. Kitavi**, & E. M. Kawira, "A Mathematical Model for Optimization of Vehicle Parking Space, " *OPSEARCH*, Springer, February 2025, pp. 1-18, https://doi.org/10.1007/s12597-025-00914-0
2. O. F. Keraro, Z. N. Morris, **D. M. Kitavi**, & M. Wanyonyi, "Forecasting Kenya's Public Debt Using Time Series Analysis," *International Journal of Advanced and Applied Sciences*, Vol. 11, no. 8, pp. 119-126, August 2024, https://www.science-gate.com/IJAAS/2024/V11I8/1021833ijaas202408013.html
3. M. B. Gatwiri, M. Ronoh, C. G. Ngari, & **D. M. Kitavi**, "Mathematical Modelling of Host-Pest Interaction in the Presence of Insecticides and Resistance: A Case of Fall Armyworm," *Hindawi Journal of Mathematics*, Vol. 2024, pp. 1 – 23, January 2024, https://www.hindawi.com/journals/jmath/2024/2886786/
4. A. M. Musyoka, M. Ronoh, P. M. Wanjau, & **D. M. Kitavi**, "Mathematical Modelling of Drug Abuse, Unemployment, and Mental Stress on Population Dynamics of Mental Illness," *Communications in Mathematical Biology and Neuroscience*, Vol. 2023, pp. 1 – 27, July 2023, https://scik.org/index.php/cmbn/article/view/8002
5. G. K. Mutua, C. G. Ngari, G. G. Muthuri, & **D. M. Kitavi**, "Mathematical Modelling and Simulating of Helicobacter Pylori Treatment and Transmission Implications on Stomach Cancer Dynamics," *Communications in Mathematical Biology and Neuroscience*, Vol. 2022, pp. 1 – 29, August 2022, https://scik.org/index.php/cmbn/article/view/7542
6. W. Maurice, **D. M. Kitavi**, D. M. Mugo, & E. B. Atitwa, "COVID-19 Prediction in Kenya Using The ARIMA Model," International Journal of Electrical Engineering and Technology (IJEET), vol. 12, no. 8, pp. 105 – 114, August 2021, https://iaeme.com/Home/article_id/IJEET_12_08_009
7. C. G. Ngari, **D. M. Kitavi**, P. M. Ngari, D. M. Muchangi, "Parameters and State Estimates of Sex-based Covid-19 Model using Kenya Data, Nonlinear Least Square and Interpolating Polynomials," *International Journal of Scientific and Research Publications*, vol. 11, no. 5, pp. 393 – 407, May 2021. https://www.ijsrp.org/research-paper-0521/ijsrp-p11348.pdf
8. C. G. Ngari & **D. M. Kitavi**, "Parameterization and Forecasting of Childhood Pneumonia Model Using Least Square Approximation, Lagrange Polynomial and Monte Carlo Simulation," *Journal of the Annual Research and Review in Biology*, vol. 35, no. 8, pp. 102 – 114, August 2020. https://www.journalarrb.com/index.php/ARRB/article/view/30265
9. **D. M. Kitavi**, K. T. Wong, T.-C. Lin, & Y. I. Wu, "Hybrid Cramer-Rao Bound of Direction Finding Using a Triad of Cardioid Sensors That are Perpendicularly Oriented and Spatially Collocated," *Journal of Acoustical Society of America*, vol. 146, no. 2, pp. 1099 – 1109, August 2019. https://asa.scitation.org/doi/10.1121/1.5120521
10. K. T. Wong, Z. N. Morris, **D. M. Kitavi**, & T.-C. Lin, "A Uniform Circular Array of Isotropic Sensors that Stochastically Dislocate in Three Dimensions – The Hybrid Cramer-Rao Bound of Direction-of-Arrival Estimation," *Journal of Acoustical Society of America*, vol. 146, no. 1, pp. 150 – 163, July 2019. https://asa.scitation.org/doi/10.1121/1.5098771
11. V. Nyokabi, **D. M. Kitavi**, & C. G. Ngari, "Cramer-Rao Bound of Direction Finding Using Uniform Arc Arrays," *Journal of Advances in Mathematics and Computer Science,* vol. 33, no. 1, pp. 1 – 15, July 2019. http://www.journaljamcs.com/index.php/JAMCS/article/view/30168
12. G. W. Ndiritu, **D. M. Kitavi**, & C. G. Ngari, "Cramer-Rao Bound of Direction Finding Using a Uniform Hexagonal Array," *Journal of Advances in Mathematics and Computer Science,* vol. 32, no. 6, pp. 1 – 14, June 2019.

http://www.journaljamcs.com/index.php/JAMCS/article/view/30161

13. M. Kinyili, **D. M. Kitavi**, & C. G. Ngari, "Aperture Maximization with Half-Wavelength Spacing, via a 2-Circle Concentric Array Geometry that is Uniform but Sparse," *Journal of Advances in Mathematics and Computer Science,* vol. 32, no. 3, pp. 1 – 20, May 2019. http://www.journaljamcs.com/index.php/JAMCS/article/view/30148
14. **D. M. Kitavi**, K. T. Wong & C.-C. S. Hung, "An L-shaped Array with Non-Orthogonal Axes – Its Cramer-Rao Bound for Direction Finding," *IEEE Transactions on Aerospace and Electronic Systems*, vol. 54, no. 1, pp. 486 – 492, February 2018. http://ieeexplore.ieee.org/document/8012415/
15. **D. M. Kitavi**, K. T. Wong, M. Zou & K. Agrawal, "A Lower Bound of Estimation Error of an Emitter's Direction-of-Arrival / Polarization, for a Collocated Triad of Orthogonal Dipoles/Loops That Fail Randomly," *IET Microwaves, Antennas & Propagation,* vol. 11, no. 7, pp. 961 – 970, June 2017. http://ieeexplore.ieee.org/document/7935594/
16. **D. M. Kitavi,** T.-C Lin, K. T. Wong & Y. I. Wu, "Direction Finding with the Sensors' Gains Suffering Bayesian Uncertainty — Hybrid CRB and MAP Estimation," *IEEE Transactions on Aerospace and Electronic Systems*, vol. 52, no. 4, pp. 2038 – 2044, August 2016. http://ieeexplore.ieee.org/abstract/document/7738373/

CONFERENCE PAPERS/PRESENTATIONS

1. G. K. Mutua, M. Kinyili, & **D. M. Kitavi**, "Mathematical modeling of the effects of screening and treatment of gastric ulcers as a control strategy for gastric cancer," *4th Meru University of Science and Technology International Conference*, June 2025.
2. **D. M. Kitavi**, "Finite Sum of Sine and Cosine Series," *Kirinyaga University 8th Annual International Conference,* March 2025.
3. S. M. Kyalo, M. Kinyili, **D. M. Kitavi**, Z. M. Mburu, & G. K. Mutua, "Assessing the Role of Post-Secondary Education Level on Unemployment Menace in Kenya," *Kirinyaga University 8th Annual International Conference,* March 2025.
4. **D. M. Kitavi** & F. M. Musyoka, "Cramer-Rao Bound for Direction-of-Arrival Estimation Using a Triad of First-Order Cardioid Sensors," *Proceedings of the International Conference on Electrical, Computer and Energy Technologies (ICECET),* 9-10 December 2021, Cape Town, South Africa. https://ieeexplore.ieee.org/document/9698456
5. C. G. Ngari, **D. M. Kitavi**, P. M. Ngari, & D. M. Mugo, "Parameters and State Estimates of Sex Based COVID-19 Model Using Kenya Data, Nonlinear Least Square and Interpolating Polynomials," *4th Kenya Institute for Public Policy Research and Analysis (KIPPRA) Annual Regional Conference*, 23-25 June 2021, Nairobi, Kenya.
6. **D. M. Kitavi** & K. T. Wong, "A Uniform Rectangular Array of Isotropic Sensors of Stochastic Gains: The Hybrid Cramer-Rao Bound for Direction Finding," *Journal of the Acoustical Society of America*, vol. 146, no. 4, pp. 2867, November 2019. https://asa.scitation.org/doi/abs/10.1121/1.5136948
7. M. Kinyili & **D. M. Kitavi**, "Precision of 3-Configurations with Respective Sub-Configurations of 2-Ring Concentric Planar Array in Direction finding," *Kirinyaga University 3rd Annual International Conference,* September 2019. https://www.kyu.ac.ke/phocadownload/Book_of_Abstracts/BOOK%20OF%20ABSTRACTS,%202019.pdf
8. **D. M. Kitavi** & M. Kinyili, "Cramer-Rao Bound of Direction Finding Using Multi-Concentric Circular Arrays," *Proceedings of the 6th International Arab Conference on Mathematics and Computations (IACMC),* pp. 49-55*,* April 2019, http://iacmc.zu.edu.jo/eng/
9. Z. N. Morris, K. T. Wong, **D. M. Kitavi,** & T.-C. Lin, "The Hybrid Cramer-Rao Bound of Direction Finding by a Uniform Circular Array of Isotropic Sensors that Suffer Stochastic

Dislocations," *Journal of the Acoustical Society of America (ASA)*, vol. 142, no. 4, pp. 2554, November 2017. http://asa.scitation.org/doi/10.1121/1.5014336

10. **D. M. Kitavi,** K. T. Wong, L. Yeh & T.-C. Lin, "Cramer-Rao Bound for Direction Finding at a Tri-Axial Velocity-Sensor of an Acoustic Event Having an AR(1) Temporal Auto-Correlation," *Journal of the Acoustical Society of America (ASA)*, vol. 141, no.5, pp. 3650, June 2017. http://asa.scitation.org/doi/abs/10.1121/1.4987895
11. **D. M. Kitavi,** H. Tan & K. T. Wong, "A Regular Tetrahedral Array Whose Constituent Sensors Fail Randomly - A Lower Bound for Direction-of-Arrival Estimation," *2016 IEEE Loughborough Antennas & Propagation Conference (LAPC*), pp. 1 – 5, November 2016. http://ieeexplore.ieee.org/document/7807600/
12. **D. M. Kitavi,** T.-C. Lin & K. T. Wong, "A Tetrahedral Array of Isotropic Sensors, Each Suffering a Random Complex Gain – The Resulting Hybrid Cramer-Rao Bound for Direction Finding," *2016 IEEE National Aerospace and Electronics Conference (NAECON) and Ohio Innovation Summit (OIS)*, pp. 412 – 415, July 2016. http://ieeexplore.ieee.org/document/7856840/

SUPERVISION OF POSTGRADUATE STUDENTS

S/No.	Name of Student	Programme of Study / University	Graduation
1.	Christine Nzomo	PhD in Education, University of Embu	Research in Progress
2.	Maurice Wanyonyi	PhD in Statistics, University of Embu	
3.	Glory Kawira	PhD in Applied Mathematics, University of Embu	
4.	Mercy Chepchirchir	MSc. in Applied Mathematics, University of Embu	
5.	Simon Kilole		
6.	James Maina		
7.	Maryanne Ngari		
8.	Frankline Keraro	MSc. in Statistics, University of Embu	Sep. 2025
9.	Moreen Brenda	MSc. in Applied Mathematics, University of Embu	Sep. 2024
10.	Albanus Musyoka	MSc. in Applied Mathematics, University of Embu	Sep. 2024
11.	Glory Kawira	MSc. in Applied Mathematics, University of Embu	Sep. 2023
12.	Maurice Wanyonyi	MSc. in Statistics, University of Embu	Sep. 2021
13.	Veronicah Nyokabi	MSc. in Applied Mathematics, University of Embu	Sep. 2019
14.	Musyoka Kinyili	MSc. in Applied Mathematics, University of Embu	Sep. 2019
15.	Grace Ndiritu	MSc. in Applied Mathematics, University of Embu	Sep. 2019