C. W. CHUKWU

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EDUCATION AND QUALIFICATION

University of Johannesburg, South Africa *Dec 2021*
PhD in Applied Mathematics
Advisor: Professor Farai Nyabadza

University of Johannesburg, South Africa *Dec 2018*
MSc in Applied Mathematics
Advisor: Dr Maria Visaya
Co-advisor: Professor Charles Villet

University of Johannesburg, South Africa *Dec 2015*
BSc(Hons) in Applied Mathematics (Cumlaude)
Advisor: Dr Justin Prentice

University of South Africa (UNISA) South Africa *Dec 2014*
BSc Mathematics and Applied Mathematics

EXPERIENCE

Wake Forest University (WFU) Aug 15, 2022 - Current
Position: *Visiting Assistant Professor* *North Carolina, USA*

University of California San Diego (UCSD) Jan - Aug 2022
Position: *Postdoctoral Scholar* *California, USA*
Advisor: Professor Natasha Martin

Universitas Airlangga Surabaya Indonesia 15 Jun - 15 Sep 2021
Position: *Postdoctoral Fellow* *Indonesia*

University of Johannesburg (UJ) Jan 7, 2019 – Dec 7, 2021
Position: *Lecturer* *South Africa*

University of South Africa (UNISA) Jun 2016 – Dec 2021
Position: *Independent Contractor* *South Africa*

University of Johannesburg Feb 2015 – Nov 2018
Position: *Teaching Assistant* *South Africa*

University of South Africa (UNISA) Oct 2016 – Oct 2017
Critical Reader *South Africa*

SCHOLARSHIPS AND AWARDS

- Symomath 2021 Conference 2020 publication Grant Awardee Conference grant for free registration and the publication fee, Grant No:070/Symomath2021/Ac/VI/2021.
- URC PhD International scholarship *Aug. Feb. 2020– Dec. 2021*

- Global Excellency scholarship Statute (GES) *Aug. 2016 - Aug. 2018*
- UJ Faculty of Science top-up and Merit Bursary *Feb. 2016 - Aug. 2018*
- UJ Faculty of Science Merit Bursary *Feb. 2016 - Dec. 2020*
- National Research Fund South Africa (NRF) Scarce skills scholarship *Feb-Dec. 2015*

CONFERENCES AND WORKSHOPS ATTENDED

- Mathematical and Computational Biology workshop at the Institute for Computational and Experimental Research in Mathematics (ICERM)/Brown University, Providence, Rhode Island, USA. *June 12 – 16, 2023*
  Poster title: A Lesson learned from modeling Listeriosis of RTE food products

- 2023 UNC Greensboro PDE virtual Conference, *Jun 9–11, 2023*

- The 13th AIMS Conference on Dynamical Systems, Differential Equations and Applications, Wilmington, NC USA, *May 31 - June 4, 2023.*
  Invited Talk title: Analysis of two-group Malaria model incorporating vaccination and optimal control
- Mathbio seminar at Virginia Tech, Virginia Tech University, USA *Apr. 19, 2023*
  Invited Talk title: Can key factors contributing to malaria transmission be prevented? A case study Indonesia

- CAT New Faculty Learning Community at Wake Forest University *Sep. 15. 2022 - Apr. 22, 2023*

- 2023 Shanks Workshop on Advances in Mathematical and Theoretical Biology, Vanderbilt University, USA *Mar. 17 - 19, 2023*
  Talk title: On modeling malaria dynamics with seasonal factor

- SMB EPI-PDEE Virtual Mini-conference (Joint meeting between the Mathematical Epidemiology and Population Dynamics, Ecology, & Evolution Subgroups) *Feb. 26 - 28, 2023*

- Virtual 2023 Annual Rockwell Lecture, University of Iowa, delivered by Herbert Hethcote *Feb. 9, 2023*
  Topic: Insight from mathematical modeling of infectious diseases.
- Multiple Virtual Colloquium on Mathematics for Public Health Organized by The Fields Institute Canada, Jan 31, Feb 7, 2023
- The 6th Black in AI Workshop, co-located with Neural Information Processing Systems (NeurIPS) 2022, New Orleans, USA *Nov. 28–Dec. 3, 2022*
  Poster title: On the modeling of Schistosomiasis transmission with intermediate host.
- 2022 Masamu Advanced Study Institute (MASI) and Workshops held in Maputo, Mozambique (Virtual) *18-27 Nov. 2022*

- 40th Southeastern-Atlantic Regional Conference on Differential Equations, North Carolina State University, Raleigh, USA *Nov. 12–13, 2022*
  Talk title: On the impact of super spreaders on COVID-19 dynamics.
- 8th International Conference on Mathematical Modeling and Analysis of Populations in Biological Systems (ICMA-VIII), University of Louisiana, Lafayette, Louisiana, USA *Oct. 28–30, 2022*
  Poster presentation: Assessing the impact of co-dynamics Listeriosis-Meningitis in human population.
- **Keynote Speaker**
  Virtual International Research Outreach Programme (IROP-2022) by Dong Thap University, Vietnam *October 3, 2022*
  Talk title: A simulation study of HIV/AIDS-Listeriosis co-dynamics in the human population.
- Virtual WHO Monkeypox Research: What are the knowledge gaps and priority research questions? *Jun 2–3, 2022*

- CBMS Conference: Interface of Mathematical Biology and Linear Algebra" held (in person) at the University of Central Florida, Orlando, FL *May 23-27, 2022*
  Poster presentation: To eat or not to eat? A lesson learnt from modelling Listeriosis of RTE food products.
- Mathematics Industrial Study Group South Africa (MISG) *2017 and 2018*
- American Women in Mathematics (AWM) lightning research talks *Nov. 17, 2022*
  Talk title: mathematical modeling and optimal control of infectious diseases
- Wake Forest University Applied Maths Weekly seminar *Nov. 10, 2022*
  Talk title: On the impact of optimal control strategies to curtail the spread of COVID-19: a case study South Africa
- CBMS Conference: Interface of Mathematical Biology and Linear Algebra" held (in person) at the University of Central Florida, Orlando, FL *May 23–27, 2022*
  Poster presentation: To eat or not to eat? A lesson learnt from modelling Listeriosis of RTE food products
- The International Symposium on Biomathematics (SYMOMATH) Indonesia *16–17 Jul 2021*
  Talk title: Modelling Listeriosis disease driven by cross-contamination of ready-to-eat food products.
- University of Johannesburg Mathematics department Monthly seminar *Jun. 10, 2019*
  Talk title: Modeling Listeriosis dynamics incorporating education campaign and hygiene control measures

LIST OF TRAVEL GRANTS/FUNDING

- ICERM, May 10, 2023, worth 1040:00 USD
- WFU Faculty Development Funding, May 17, 2023, worth 1000:00 USD
- WFU Provost Travel Fund, April 27, 2023, worth 1000:00 USD
- NSF for AIMS 2023 conference Lodging worth 211.20 USD
- Shanks Workshop in March 2023 grant worth 1000:00 USD
- Black in AI conference, November 2022, worth 1200:00 USD

- 40^{th} SAERDCE in November 2022 grant worth 560:00 USD
- WFU college in October 2022 worth 960:00 USD

TECHNICAL SKILLS AND SOFTWARE

Programming Languages	MATLAB, Javaplex, Mathematica, Latex, R, Python and Maple
Operating Systems	Windows, Linux (Ubuntu, Fedora and Kali-Linux), Mac OS and Microsoft Office/Excel and Endnote
Teaching softwares	Canvas, Webassign and Blackboard collaborate, WIN.

ADVISING EXPERIENCE

Joel-Pascal Ntwali N'Konzi Nov 2021

Modeling the Role of Fear on COVID-19 Infection Dynamics (Cum laude)

Institution: African Institute for Mathematical Sciences (AIMS) South Africa.
Degree: AIMS structured masters.
Adivisor's Professor Farai Nyabadza & Dr. C.W. Chukwu.

Nhlangano Dale Maluleke Nov 2021

Modelling the role of selective HIV/AIDS treatment for immigrant population: The case of Botswana.

Institution: African Institute for Mathematical Sciences (AIMS) South Africa.
Degree: AIMS structured masters.
Adivisors Professor Farai Nyabadza & Dr. C.W. Chukwu.

PROFESSIONAL MEMBERSHIP

- **Models of Infectious Disease Agent Study (MIDAS) Network**
- **Black in AI**
- **Applied Malaria Modeling Network (AMMnet)**
- **International Society of Difference Equations (ISDE)**
- **Golden Key International Honour Society (GKIHS)**- Lifetime membership
- **Society of Industrial and Applied Mathematics (SIAM)**-Early career membership.
- **Society for Mathematical Biology (SMB)**-Student membership
- **South African Mathematical Science Association (SAMSA)**
- **South African Mathematics Society (SAMS)**

COURSES TAUGHT AT UNIVERSITY LEVEL

- Spring/Summer 2023–MTH 111-Calculus with Analytical Geometry 1–Wake Forest University
- Fall 2022–MTH 111-Calculus with Analytical Geometry 1–Wake Forest University
- Fall 2022–MTH 165B-Problem-Solving Seminar(Modeling methods)–Wake Forest University
- MAT1512: Calculus A – Year 1–University of South Africa
- MAT2615: Multivariable Calculus – Year 2–University of South Africa
- MAT1613: Calculus B – Year 2–University of Johannesburg
- MAFT03A and MAF03B: Mathematics for teachers – Year 3–University of Johannesburg

- Calculus of one variable – Year 1–University of Johannesburg
- AMP2611: Differential equations – Year 2–University of South Africa
- EMT4801: Engineering mathematics – Year 4–University of South Africa
- MAT1503 & MAT2611: Linear algebra – Year 1 and 2–University of South Africa

RESEARCH INTERESTS

Mathematical Biology, Multiscale modelling, Partial Differential Equations, Machine Learning, Data Analysis, and Optimal Control Theory.

SELECTED PUBLICATIONS

- Chazuka Z., Chukwu C.W., and Moremedi G. M., On modelling the in-host dynamics of HIV/HPV co-infection in the human population, Commun. Math. Biol. Neurosci., 2023 (2023), Article ID 79
- Aldila D., Awdinda N., Farrel H., F. Fatmawati and Chukwu C.W., Optimal control of pneumonia transmission model with seasonal factor: Learning from Jakarta incidence data, Heliyon, (2023), https://doi.org/10.1016/j.heliyon.2023.e18096.
- Fatmawati, Chukwu C.W., Alqahtani R. T., Alfiniyah C., Herdicho F.F., Tasmi, A Pontryagin's maximum principle and optimal control model with cost-effectiveness analysis of the COVID-19 epidemic, Decision Analytics, 2023, 100273, https://doi.org/10.1016/j.dajour.2023.100273.
- Gao S., Pant B., Chukwu C.W., Kwofie T., Newman L., Choe S., Laurie Balstad, Safdar S., Attipoe W., Li J., K.D. Bimal, Li Y., Z. Wenjing and van den Driessche P., A mathematical model to assess the impact of testing and isolation compliance on the transmission of COVID-19, Infectious Disease Modelling, 2023, https://doi.org/10.1016/j.idm.2023.04.005.
- Chukwu C.W., Nyabadza F., and Asamoah J.K.K. Inter., A mathematical model and optimal control of Listeriosis from ready-to-eat food products, Int. J. Computing Science and Mathematics, Vol. 17, No. 1, 2023, DOI:10.1504/IJCSM.2023.10055620.

  https://doi.org/10.28919/cmbn/7875, ISSN: 2052-2541
- Tchoumi S.Y., Chukwu C.W., Diagne M.L. et al., Optimal control of a two-group malaria transmission model with vaccination, Netw Model Anal Health Inform Bioinforma 12, 7 (2022), https://doi.org/10.1007/s13721-022-00403-0.
- Obaido G., Ogbuokiri B., Swart T.G., Ayawei N., Kasongo S.M., Aruleba K., Mienye I.D., Aruleba I., Chukwu C.W., Osaye F. and Egbelowo O.F., An interpretable machine learning approach for Hepatitis B diagnosis, Applied Sciences, 12(21), p.11127, 2022, https://www.mdpi.com/2076-3417/12/21/11127.
- Chukwu C.W., Juga M. L. Chazuka Z. and Mushayu J., Mathematical analysis and sensitivity assessment of HIV/AIDS-Listeriosis co-infection dynamics, Int. J. Appl. Comput. Math 8, 251 (2022), https://doi.org/10.1007/s40819-022-01458-3.
- Gatyeni P., Chukwu C.W., Chirove F., Fatimawati and Nyabadza F., Application of optimal to long term dynamics of Covid-19 disease in South Africa, Scientific African, p.e01268, https://doi.org/10.1016/j.sciaf.2022.e01268.
- Mushanyu J., Chukwu C.W., Nyabadza F. and Muchatibaya G., Modelling the potential role of super spreaders on COVID-19 transmission dynamics, Int. J. Math. Model. Numer. Optim, 12(2), pp.191-209,2022, https://doi.org/10.1504/IJMMNO.2022.122123.

- Chukwu C.W., Nyabadza F. and Fatimawati, Modeling the potential role of media campaigns on the control of Listeriosis, Mathematics Bioscience Engineering, 2021, 18(6): 7580-7601, https//doi:10.3934/mbe.2021375.
- Chukwu C.W., Mushayua J., Juga M. L. and Fatimawati, A mathematical model and of co-dynamics of Listeriosis and meningitis diseases, Communications in Mathematical Biology and Neuroscience, 2020 (2020), Article ID 83, https://doi.org/10.28919/cmbn/5060.
- Nyabadza F., Chirove F., Chukwu C.W. and Visaya M.V., Modelling the potential impact of social distancing on the COVID-19 epidemic in South Africa, Computational and Mathematical Methods in Medicine, vol. 2020, Article ID 5379278, 12 pages, 2020, https://doi.org/10.1155/2020/5379278.
- Chukwu C.W. and Nyabadza F., A theoretical model of Listeriosis driven by cross-contamination of ready-to-eat food products, International Journal of Mathematics and Mathematical Sciences, 2020, Article ID 9207403, 14 pages, (2020), https://doi.org/10.1155/2020/9207403.

MEDIA MENTION

Dont-rush-out just yet because-social-distancing works expert May 01, 2020
Project on COVID-19 modeling *Johannesburg, South Africa*

Name of Magazine/Newspaper: Sunday times
https://www.timeslive.co.za/news/south-africa/2020-05-01-dont-rush-out-just-yet-because-social-distancing-works-experts/
Author: Kgaugelo Masweneng

· **Modeling the potential role of super spreaders on COVID-19 transmission dynamics** *Apr. 19, 2022*
Name of Website: Phys.org
https://phys.org/news/2022-04-potential-role-super-spreaders-covid-.html
Author: David Bradley

RESEARCH PROFILES

Google Scholar Scopus ORCID

REFERENCES

Available on request.