Kayode Olumoyin

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https://github.com/okayode
https://okayode.github.io

Research Interest
Deep Learning, Mathematical Oncology, Infectious Disease Modeling, Numerical Analysis, Numerical Partial Differential Equations, and Fractional Differential Equations.

Education

- Ph.D., Computational Science, Middle Tennessee State University, Murfreesboro, Tennessee, **May, 2022**.
- M.A., Computational and Applied Mathematics, Bowling Green State University, Bowling Green, Ohio, **August, 2016**.
- M.A., Mathematics, Marshall University, Huntington, West Virginia, **May, 2013**.
- B.Sc., Mathematics, University of Agriculture, Abeokuta, Nigeria, **January, 2009**.

Experience

- **Moffitt Cancer Center, Tampa, FL**
  - Applied Postdoctoral Fellow, Integrated Mathematical Oncology
    August, 2022 – Present
- **Middle Tennessee State University, Murfreesboro, TN**
  - Adjunct Faculty, Mathematics Department
    Fall, 2021 – Spring, 2022
  - Graduate Teaching Assistant, Mathematics Department
    Fall, 2020 – Spring, 2022
  - Mentor, Student Athletics Enhancement Center
    Fall, 2019 – Spring, 2020
  - Adjunct Faculty, University Studies
    Fall, 2019
  - Lecturer, University Studies
    Fall, 2016 – Summer, 2019
- **Bowling Green State University, Bowling Green, OH**

- Graduate Teaching Assistant, Mathematics Department
  Fall, 2013 – Spring, 2016

- **Marshall University, Huntington, WV**
  - Graduate Teaching Assistant, Mathematics Department
    Fall, 2011 – Spring, 2013

- **National Youth Service Corp (volunteer program), Borno, Nigeria**
  - Headmaster, Bayo Foundation School, Briyel, Bayo LGA
    January, 2010 – July, 2010
  - Mathematics Teacher, UBE Junior School, Briyel, Bayo LGA
    August, 2009 – January, 2010

Programming Skills

Python, TensorFlow, Keras, PyTorch, FEniCS, FreeFem++, C, C++, MPI, Matlab, Mathematica,

Awards

1. Best presentation award at CBAS Graduate Research Showcase, February 5, 2021, Middle Tennessee State University, Murfreesboro, Tennessee.
2. SIAM student travel award to attend 2020 SIAM conference on Mathematics of Data Science (MDS20), May 5 – 7, 2020, Cincinnati, Ohio.
3. Winifred O. Stone Presidential Graduate Scholarship Award for Diversity Enhancement, 2013 & 2014, Bowling Green State University.
4. First Position, National Mathematics Competition for University Students (NAMCUS 2008), Abuja, Nigeria.

Publications

1. Olumoyin, K.D. Data-driven deep Neural Networks for epidemiological and biochemical models, Ph.D. dissertation, Middle Tennessee State University, **2022**.
2. Olumoyin, K.D., Khaliq, A.Q.M., Furati, K.M. Multi-variant COVID-19 model with heterogeneous transmission rates using deep neural networks. *arXiv:2205.06834v1* **2022**. `https://doi.org/10.48550/arXiv.2205.06834`
3. Olumoyin, K.D. Learning differential equations from data. *arXiv:2205.11483v1* **2022**. `https://doi.org/10.48550/arXiv.2205.11483`
4. Olumoyin, K.D, Khaliq, A.Q.M., Furati, K.M. Data-driven deep learning algorithm for Asymptomatic COVID-19 model with varying mitigation measures and transmission rate. *Epidemiologia* **2021**, 2, 471 – 489. `https://doi.org/10.3390/epidemiologia2040033`

5. Olumoyin, K.D, Khaliq, A.Q.M., Furati, K.M. Data-driven deep learning algorithms for time-varying infection rates of COVID-19 and mitigation measures. *arXiv:2104.02603v3* **2021**. https://doi.org/10.48550/arXiv.2104.02603

6. Olumoyin, K.D. Solutions of Dynamic Equations on Time Scales with Jumps, M.A. thesis, Marshall University, **2013**.

7. Lawrence, B.A., Olumoyin, K.D., Peterson, M.K. Solutions of dynamic equations on a sequence of converging time scales. AMS Fall Central Sectional Meeting, Washington University, St. Louis, Missouri, **October 18 – 20, 2013**. http://www.ams.org/meetings/sectional/2204_program_saturday.html

Conference Presentation

1. *Physics-informed Attention Neural Network: Learning the dynamics of Partial Differential Systems with an attention-based model.* Lightening talk at Holistic Design of Time-Dependent PDE Discretizations, Topical Workshop held at ICERM, Providence, Rhode Island, **January 10 – 15, 2022.**

2. *Data-driven deep learning algorithm for Asymptomatic COVID-19 model with time-varying transmission rate.* poster presentation at Modeling in a Heterogeneous World, XVIII Red Raider Mini-symposium, held at Texas Tech University, Lubbock, Texas, **August 20 – 21, 2021.**

3. *Data-driven deep learning algorithms for COVID-19 time-varying infection rates and mitigation measures.* mini-symposium at SIAM Conference on Computational Science and Engineering, CSE21, held Virtually, **March 1 – 5, 2021.**

4. *Learning time-varying COVID-19 infection rate from data.* CBAS Graduate Research Showcase, Middle Tennessee State University, Murfreesboro, Tennessee, **February 5, 2021.**

5. *PDE Based Neural Network Approach Using Noisy Data in Facial recognition.* SIAM conference on Mathematics of Data Science (MDS20), Cincinnati, Ohio, **May 5 – 7, 2020.**

6. *The Marshall–Simpson Differential Analyzer Project: Mechanical Interpretations of Mathematical Equations* (co–presented with Dr. Bonita Lawrence and Molly Peterson), Simpson College, Iowa, **March 18, 2013.** https://simpsoncollegemath.blogspot.com/

7. *Generalization of First Order Linear Differential and Difference Equations.* 40th Annual Mathematics and Statistics Conference, Miami University, Oxford, Ohio, **September, 2012.**

Conference Participation

1. MANNA (Modeling, Analysis and Numerics for Nonlocal Applications), Santa Fe, New Mexico, December 11 - 15, 2017.

2. Informal Analysis Seminar, Kent State University, Ohio, **April 11 – 13, 2014.**

3. 40th Annual Mathematics and Statistics Conference, Miami University, Oxford, Ohio, **September, 2012.**

4. 96th Annual Meeting of the Mathematical Association of America, Ohio Section, Spring 2012, Xavier University, Cincinnati, Ohio, **April, 2012.**

5. The 31st Southeastern-Atlantic Regional Conference on Differential Equations, Georgia Southern University, Georgia, **September, 2011.**

Professional Membership

SIAM, Pi Mu Epsilon (West Virginia beta)