

Chisondi S. Warioba, PhD

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Current Affiliation: Stanford University School of Medicine
Department of Anesthesiology, Perioperative and Pain Medicine
Division of Pain Medicine
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Current Position

T32 Postdoctoral Scholar

May 2025 - Present

Stanford University School of Medicine

Department of Anesthesiology, Perioperative and Pain Medicine, Division of Pain Medicine

Principal Investigator: Sean Mackey, MD, PhD

Research Focus: Developing machine learning algorithms and computational approaches for high-dimensional neuroimaging data analysis to investigate brain biomarkers in pain studies

Education

Ph.D., Medical Physics

September 2021 - June 2025

University of Chicago, Chicago, IL, USA

Thesis: “Cross-Species Mapping of Functional Connectivity Alterations and Therapeutic Responses in Hyper-Acute Ischemic Stroke”

Advisor: Timothy Carroll, PhD

B.S. Chemistry, B.A. Physics, B.A. Biology

September 2017 - June 2021

Westmont College, Santa Barbara, CA, USA

Major Honors Thesis (A+) in Chemistry

Professional Affiliations

Academic Visitor

September 2023 - August 2024

University of Oxford, Oxford, UK

Department of Clinical Neurosciences

Research Experience

T32 Postdoctoral Scholar

May 2025 - Present

Stanford University School of Medicine, Division of Pain Medicine

- Developing machine learning algorithms for high-dimensional neuroimaging data analysis
- Implementing data analysis pipelines for complex datasets across multiple imaging modalities
- Applying computational approaches to investigate brain biomarkers in pain studies
- Collaborating with interdisciplinary teams on translational pain research

NSF Graduate Research Fellow

August 2023 - June 2025

University of Chicago, Department of Radiology

- Developed algorithms for resting-state functional connectivity analysis using group ICA
- Applied statistical methods to assess RSN (resting-state network) integrity across treatment groups (n=40)
- Implemented BOLD time-lag analysis and global mean signal processing techniques
- Created computational pipelines for analyzing cerebral perfusion and hemodynamic changes
- Published first-author papers in *Nature Scientific Reports* and *AJNR*

Graduate Research Assistant

September 2021 - August 2023

University of Chicago, Department of Radiology

- Performed comparative analysis of x-ray and micro-CT systems for quantitative assessment
- Developed image analysis protocols and reconstruction algorithms for preclinical imaging
- Gained expertise in multimodal imaging approaches and cross-platform optimization

Undergraduate Research Assistant

September 2017 - June 2021

Westmont College, Departments of Chemistry and Mathematics

- Applied density functional theory (DFT) calculations for computational chemistry research
- Created novel mathematical visualization algorithms for analyzing segregation patterns
- Developed smooth two-dimensional surface modeling techniques
- Published in *Mathematics Magazine* (Carl B. Allendoerfer Award) and *Organometallics*

Technical Skills

Programming Languages: Python (NumPy, SciPy, Pandas, scikit-learn), MATLAB (SPM, FSL), R, C++

Statistical Analysis: Independent Component Analysis (ICA), time series analysis, paired t-tests, Mann-Whitney U tests, ANOVA, Tukey's HSD, FDR correction, regression modeling, mixed-effects models

Neuroimaging Analysis: BOLD signal analysis, resting-state fMRI processing, DTI analysis, structural MRI segmentation, multi-modal integration

Machine Learning: Pattern recognition, high-dimensional data analysis, network analysis, deep learning frameworks (PyTorch, TensorFlow)

Data Management: Experience with large-scale datasets, BIDS format, data harmonization protocols

Selected Publications

1. **C.S. Warioba**, T.J. Carroll, G. Christoforidis. "Flow Augmentation Therapies Preserve Brain Network Integrity and Hemodynamics in a Canine Permanent Occlusion Model." *Nature Scientific Reports*, 14:16871, 2024.
2. **C.S. Warioba**, M. Liu, S. Penano, S. Foxley, G.A. Christoforidis, T.J. Carroll. "Efficacy Assessment of Cerebral Perfusion Augmentation Through Functional Connectivity in an Acute Canine Stroke Model." *American Journal of Neuroradiology*, 45(9):1214-1219, 2024.
3. D.J. Hunter and **C. Warioba**. "Segregation Surfaces." *Mathematics Magazine*, 94(3):163, 2021.
4. **C.S. Warioba**, L.G. Jackson, M.A. Neal, B.E. Haines. "Computational Study on the Role of Zn(II) Z-Type Ligands in Facilitating Diaryl Reductive Elimination from Pt(II)." *Organometallics*, 42(16), 2023.

Awards and Honours

- National Science Foundation Graduate Research Fellowship **2023-2025**
- Carl B. Allendoerfer Award, Mathematics Association of America **2022**
National award for exceptional mathematical exposition
- Academic Visitor Award, University of Oxford **2023-2024**
- Initiative for Maximizing Student Development Fellowship, U. Chicago **2021**
- Quantum Foundry Fellowship, National Science Foundation **2020**

Teaching Experience

Teaching Assistant **September 2021 - May 2023**

University of Chicago, Department of Radiology

- Interactions of Ionizing Radiation with Matter (Fall 2021, Fall 2022)
- Physics of Medical Imaging II (Spring 2022, Spring 2023)

Leadership and Service

- Co-President, Graduate Program of Medical Physics, University of Chicago **2023**
- DEI Student Liaison, Graduate Program of Medical Physics, University of Chicago **2023**

Professional Memberships

- Organization for Human Brain Mapping (OHBM) **2023 - Present**
- International Society for Magnetic Resonance in Medicine (ISMRM) **2022 - Present**

Additional Training

Introduction to Probability (STAT110x) **January 2025 - Present**

Harvard University (via edX)

Comprehensive probability theory course covering discrete and continuous distributions

MITx MicroMasters in Statistics and Data Science **January 2025 - December 2026 (Expected)**

Massachusetts Institute of Technology (via edX)

Courses: Probability - The Science of Uncertainty and Data, Fundamentals of Statistics, Machine Learning with Python, Capstone Exam in Statistics and Data Science

References

Available upon request

Last updated: July 2025