# Jason Uwaeze

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## Education

**Rice University** *Doctor of Philosophy (Ph.D.) in Computer Science* *Expected: May 2026*

- GPA: 3.83/4.0 (Rice University Spotlight)
- **Coursework:** Intro to Deep Learning, Intro to Computer Vision, Neural Methods for Image Synthesis, Learning Algorithms for Computational Medicine, AI for Healthcare

**University of Texas at Dallas** *Bachelors of Science in Computer Science* *Jan 2019 - Dec 2021*

- GPA: 3.85/4.0)
- **Coursework:** Intro to Machine Learning, Intelligent Systems Analysis, Probability & Statistics, C/C++ in UNIX/LINUX Command Line Environment

## Experience

**Gradute Student Researcher** *Houston, TX*
*Rice University* *Aug 2022 - Present*

- Developed an attention-based deep learning approach for predicting future strokes in patients with CF-LVAD implantation using tabular and imaging data
- Enhanced the performance of TabNet model using CTGAN and SMOTE oversampling techniques
- Conducted unsupervised multiple sclerosis lesion tracking in brain MR imaging using nonlinear dimensionality techniques

**Machine Learning (Vision) Research Intern** *Idaho Falls, ID*
*Idaho National Laboratory* *Jun 2024 - Aug 2024*

- Leveraged 2D and 3D patch-based CNN models for efficient 3D reconstruction and characterization of irradiated nuclear material using keras and tensorflow.
- Achieved mean **F1**, **recall**, and **precision scores** of **0.84, 0.83, and 0.86**, respectively
- Applied class activation maps to understand model behavior and optimize error functions
- Developed a framework for systematic registration of sparse microscopy and spectroscopy images

**Machine Learning (Language) Research Intern** *Yorktown Heights, NY*
*IBM Research* *Jun 2022 - Aug 2022*

- Created a systematic evaluation framework for analyzing fairness and bias in large language models.
- Leveraged huggingface API and pretrained BERT models for semantic analysis of user-defined prompts
- Research experience with Dr. Rogerio Abreu de Paula

**Siemens Undergraduate Research Scholar** *Richardson, Texas*
*University of Texas at Dallas* *Aug 2021 - Dec 2021*

- Research experience with Dr. Kanada Basu and Dr. Shamik Kundu on effective in-field testing for functional safety and adversarial weight attacks in deep neural networks
- Curated datasets with **1000** labeled anaphor-antecedent pairs to improve bridging resolution understanding in large language models
- Research experience with Dr. Vincent Ng and Dr. Hideo Kobayashi

**Extreme Blue Technical Intern** *Austin, TX*
*IBM* *Jun 2024 - Aug 2024*

- Developed a performance evaluation system that enhanced IBM's hardware verification efficiency using MongoDB, Python, C++ and profiling tools such as Callgrind
- Improved efficiency of hardware verification life cycle by nearly **20%**

**Machine Learning Engineer Intern** *Bengaluru, India*
*Infosys* *Jun 2024 - Aug 2024*

- Developed a medical semantic search algorithm utilizing Microsoft SPTAG python library and Google BERT model for approximate nearest neighbor search and domain understanding

**Full Stack Software Developer Intern** *Austin, TX*
*IBM* *Jun 2024 - Aug 2024*

- Aided IBM's Cybersecurity Incidence Response Team in developing a web application that automated **30%** of their caseload and modernized their in-house technologies
- Hands on experience with HTML, CSS, JavaScript,and NoSQL

## Publications

**[1] Automation of ultrasonographic optic nerve sheath diameter measurement: A narrative review of image analysis and machine learning techniques.** *Under Review* *October 2024*

César Ocañas, Noelia Cardona, Alireza Akhbardeh, ***Jason Uwaeze***, Mohammad Hirzallah

**[1] Machine Learning Assisted Stroke Prediction in Mechanical Circulatory Support: Predictive Role of Systemic Mitochondrial Dysfunction** *Under Review* *Aug 2024*

Jacob P. Scioscia, Ivan Murrieta-Alvarez, Shiyi Li, Zicheng Xu, Guangyao Zheng, ***Jason Uwaeze***, Nandan Mondal

**[2] Automatic Active Lesion Tracking in Multiple Sclerosis Using Unsupervised Machine Learning** Mar 2024

***Jason Uwaeze***, Ponnada A. Narayana, Arash Kamali, Vladimir Braverman, Michael A. Jacobs, and Alireza Akhbardeh

10.3390/diagnostics14060632

## Leadership and Service

**Rice DiverSCity Group Mentor** *Jan 2024 - May 2024*

- Co-founded Rice DiverSCity, a group designed to foster community and academic support for undergraduates from historically excluded populations in computer science

**Rice Graduate Student Pathways Program Mentor** *Aug 2023 - May 2024*

- Organized events and led discussions to help first-year underrepresented minority PhD students acclimate to graduate school

**Rice Graduate Student Ambassador** *Jan 2023 - May 2024*

- Hosted coffee chats and seminars for incoming Rice University PhD students
- Produced creative content for Rice Graduate Studies: YouTube Video

## Projects

**DALP: Diffusion based Active Lesion Prediction** *Github*

- Developed using a Diffusion Probabilistic Model (DPM) for automatic active lesion identification
- Achieved **F1** scores greater than **0.80**
- Tools Used: Python, Pytorch, Jupyter Notebook, Linux, Cuda

**Evaluation of Concept Bottleneck Models for Medical Imaging** *Github*

- Evaluated concept bottle neck models, LaBo, reliance on GPT3 generated concepts for interpretable medical image classification
- Tools Used: Few-Shot Learning, Transfer Learning, Cifar10, CLIP, GPT-3-text-davinci-002