Rahul Kumar Dass

(remote) Riverview, FL

April 2023–Present

Experience

Georgia Tech

Postdoctoral Research Scientist and Project Manager

- Leading a 11-member research team in the planning and execution of multiple projects tackling problems intersecting AIbased personalized learning and scientific modeling pedagogy. Leading weekly project meetings to update stakeholders (researchers, customers, and leadership) regarding projects' progress, issues, deliverables, and timeline.
- Identified and mitigated project issues by improving software testing and documentation practices, resulting in a 50% decrease in AWS operational costs while maintaining performance, and on-time successful deployments of A/B experiments for a novel AI-coach feature across two institutions.

Harvard in Tech Seattle

- Lead Data Scientist
 - Led a cross-disciplinary 6-member team on a news disinformation project from the ground-up for a non-profit org.
 - Responsible for designing an NLP-based pipeline to estimate the "factual" nature of user provided news articles by exploring text embedding representations with **naïve bayes**, **RNN** and **transformer**-based methods and comparing text similarity and context-analysis metrics. (**Python; scikit-learn; spaCy; ULMFit; BERT**)

Amazon

Applied Scientist Intern

• Identified subregions of clustered data that do not form a one-to-one mapping with provided general demographic categories by analyzing high-dimensional face representations using public benchmarks; impacting model robustness and inclusivity assessment for multiple AWS face service stakeholders and allowing for a better understanding of "diversity" in faces (Python; PCA; UMAP; tSNE; KMeans; HDBSCAN; PyTorch; Jupyter Notebooks; AWS EC2/S3).

University of Miami

Computer Vision Predoctoral Fellow

- Led the design and development of an end-to-end equitable deep learning methodology to generate and interpret racial categories using mugshot data as part of a three-year multistakeholder assessment of ML bias applied in the context of U.S. criminal justice system.
- By mitigating four types of harmful biases, improving fairness metrics by 0.22% to 34.27% across eight deep CNN architectures and proposing a rigorous "self-auditing" model evaluation strategy (**fastai/PyTorch, Jupyter Notebooks**), key fellowship deliverables include multiple first-author peer-reviewed publications and a Social Equity Grant (\$40k).

Robotics Vision Researcher

- Ranked 4th as part of the UM RoboCanes robotics team in the international 2021 RoboCup@Home virtual competition for performing real-time perception tasks such as "clean-up", "avoid obstacles and bring item" using a Toyota Human Support Robot in simulation (**Docker, ROS, and Gazebo**).
- Improved and optimized the existing 2D object recognition stack by using data labeling abstractions, context-driven data augmentations and exploring the ML model and hyperparameter space (**Python, OpenCV, darknet, YOLO v3/v4 etc.**).

Education

 University of Miami
 Coral Gables, FL

 Doctor of Philosophy in Computer Science; GPA: 3.85/4.00
 August 2022

 Dissertation: Development of Trustworthy Image Classification Systems within a Sociotechnical Context
 August 2022

 Committee: Dr. Ubbo Visser (Chair), Dr. Odelia Schwartz, Dr. Victor Milenkovic, and Dr. Nick Petersen (Sociology, external)
 Terre Haute, IN

Master of Science in Computer Science, GPA: 3.89/4.00 **Thesis:** Decision Tree Learning – implementation and improvement of ID3 algorithm **Advisor:** Dr. Lászzló Egri.

Lancaster UniversityLancasterMaster of Physics in Theoretical Physics*, GPA: 3.0/4.0 (Second Class Honours)**[Completed 3-years of full-time undergraduate coursework and proceeded straight to a Master's degreeThesis: Quantum Field Theory IIAdvisor: Dr. Anupam Mazumdar.

Atlanta, GA January–April 2023

Atlanta, GA

Coral Gables, FL

August 2019–August 2022

May 2021–July 2021

August–December 2022

Terre Haute, IN May 2017

Lancaster, United Kingdom July 2013

Fellowships and Grants

- <u>U-LINK Predoctoral Fellowship</u>, University of Miami (Aug 2019–May 2022): selected from 41 graduate student applicants across 3 UM campuses to support interdisciplinary Ph.D. research focusing on the development of trustworthy computer vision systems and understanding how racialization occurs within AI and society.
- Miami Clinical and Transitional Science Institute Grant, University of Miami (Dec 2020-August 2021): coinvestigated with ophthalmology researchers to investigate the extent of racial-ethnic bias when predicting the severity of diabetic retinopathy diagnoses.
- U-LINK Phase 1 Grant, University of Miami (Jan–Aug 2019): responsible for detailing a deep learning pipeline to link arrestees' physical characteristics with their criminal sentencing outcomes to show racial disparities within Miami-Dade County, mentioned as an equal contributor despite being a Ph.D. student as part of a 4-faculty member team.

Peer-reviewed Journal and Conference Publications [Google Scholar]

- John Kos, Kenneth Eaton, Sareen Zhang, **Rahul K Dass**, Stephen Buckley, Sungeun An, and Ashok Goel. "Using Analytics on Student Created Data to Content Validate Pedagogical Tools." *working paper* [arXiv]
- Rahul K. Dass. "Development of Image Classification Systems in a Sociotechnical Context." Ph.D. Dissertation, University of Miami, 2022. Scholarship@Miami: <u>991031724619902976</u>
- Rahul K. Dass, Nick Petersen, Marisa Omori, Tamara R. Lave, and Ubbo Visser. "Detecting Racial Inequalities in Criminal Justice: Towards An Equitable Deep Learning Approach for Generating and Interpreting Racial Categories using Mugshots." *AI & Society (Springer) Journal Special Issue on AI for People, 2022.* DOI 10.1007/s00146-022-01440-z
- Rahul K. Dass, Nick Petersen, Ubbo Visser, and Marisa Omori. "It's Not Just Black and White: Classifying Defendant Mugshots Based on the Multidimensionality of Race and Ethnicity." *Proceedings of the 17th Conference on Computer and Robot Vision*, 2020. DOI 10.1109/CRV50864.2020.00039, IEEE Xplore, pp. 238-245.

Reviewer

- 2021 RoboCup Symposium
- 2021 International Conference on Learning Representations (ICLR) Workshop on Responsible AI
- 2020 Scientific Reports Nature Research Journal