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Rahul Kumar Dass

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Education

University of Miami — Coral Gables, FL
Doctor of Philosophy in Computer Science; GPA: 3.85/4.00 — **May 2022 (Expected)**

Indiana State University — Terre Haute, IN
Master of Science in Computer Science, GPA: 3.89/4.00 — May 2017
Thesis: Decision Tree Learning – implementation and improvement of ID3 algorithm
Advisor: Dr. Lászzló Egri.

Lancaster University — Lancaster, United Kingdom
Master of Physics in Theoretical Physics, GPA: 3.0/4.0 (Second Class Honours) — July 2013
Thesis: Quantum Field Theory II
Advisor: Dr. Anupam Mazumdar.

*Bachelor Degree equivalency**
**[Completed three-years of full-time undergraduate coursework and proceeded straight to a Master's degree.]*

Experience

University of Miami — Coral Gables, FL
Graduate Research Assistant - *Department of Computer Science* — January 2018 – August 2019

- Installing and configuring a cluster (1-head node and 32-compute nodes) from scratch to create an NSF-funded **open source**, distributed HPC infrastructure for experimental evaluation of an automated theorem proving system called StarExec-Miami, fork of StarExec which uses enterprise level architecture. (NSF Award Number 1730419)
- Improved codebase for jobs to fully utilize hardware resources by using native StarExec, **SGE** and **Linux log files** to debug, troubleshoot and resolve software compatibility issues. Code edits were proposed as **git** pull requests and were merged with the original StarExec repository.

Graduate Teaching Assistant - *Department of Computer Science* — August 2017 – May 2019

- CSC 424 – Network communication and security (Grader** and held 4-hr/week **C** lab sessions > 20 undergrad CS seniors)
- CSC 220 – Computer Science Programming II (4-hr weekly **Java** lab sessions > 30 undergrad CS majors)
- CSC 401 – Computer Science Practicum 1 (Grader** and held weekly **JS/HTML** office hours for 8 undergrad CS seniors)
- CSC 545 – Intro. to Artificial Intelligence (Grader** and 7-hr/week **Java** lab sessions to help CS seniors)

***[created **bash scripts** and/or **Makefiles** to help automate student grading]*

Summer Research Assistant - *Department of Sociology* — May 2018 – July 2018

- Improved manual data preprocessing by automation; linking 200,000 unlabeled mugshots' jail number IDs with their court records and created a training dataset of 14,000 mugshots for 3 student raters resulting to 42,000 individual labels as part of a machine learning pipeline that could not have been distributed without using **Python scripts** and **Linux tools**.

Research Projects

- *Predictive Policing* (Aug 2019 – present): testing if current deep learning models reinforce racial inequalities based on transfer learning approaches using **Python**, **Keras/TensorFlow** and **TorchVision/PyTorch**. Also, exploring if adding facial landmark measures and image preprocessing (face segmentation, cropping, pose correction etc.) using **OpenCV/Dlib** improves arrestee's race/ethnicity classification to help prevent bias within the criminal justice system.

- *Facial profiling using deep learning* (Dec 2018 – July 2019): assessed mugshots' classification accuracies based on 1) two race groups (Black and White), and 2) four race/ethnicity subgroups (Black Hispanic, Black non-Hispanic, White Hispanic, White non-Hispanic) by fine-tuning VGG-16 and VGG-Face models using two Nvidia Tesla P100s, obtaining 85% and 93.7% for task 1, and 43.6% and 50.2% for task 2. Used **Python, NumPy, scikit-learn and Keras/TensorFlow.**

Leadership and Awards

- **U-LINK Predoctoral Fellowship ($40,000 per year, 3-years), University of Miami** (Aug 2019 – Present): selected as one of two recipients from a pool of 41 graduate student applicants across three UM campuses based on the merits of a proposed interdisciplinary project, team of mentors from Computer Science and Sociology and potential societal impact.

- **U-LINK Phase 1 Grant ($40,000), University of Miami** (Jan – Aug 2019): selected as the only graduate student team member listed on a U-LINK interdisciplinary Phase 1 grant out of 7 awarded faculty team projects for proposing to link criminal sentencing disparities with arrestees' physical characteristics in Miami-Dade County using machine learning. ($10,000 to Dass)

Programming Languages and Technologies

Python; C/C++; Linux tools; Vim; Bash; LaTeX; SQL; Git/Github – proficient.
TensorFlow; JavaScript; MongoDB; Redis; PostgreSQL; Java – prior experience.
OpenCV, NumPy, Pandas, Matplotlib, scikit-learn – Data Science tools used

Technical Documents***

***[For a complete list, please visit: https://miami.academia.edu/RahulDass Note: this is not a list of publications but a list of technical documentations written when conducting independent research/projects.]

[1] Dass R., *Q-Learning: Tabular to Neural Networks.* ECE 753 – Final Report, University of Miami, 2018.

[2] Dass R., Ma L., and Manolovitz B., *Reinforcement Learning: Navigating mazes using SARSA.* ECE 648 – Project 3, University of Miami, 2018.

[3] Ma L., Manolovitz B., and Dass R., *Radial Basis-function Network.* ECE 648 – Project 2, University of Miami, 2018.

[4] Ma L., Manolovitz B., and Dass R., *Linear Classification: Perceptron vs WINNOW.* ECE 648 – Project 1, University of Miami, 2018.

[5] Dass R., *Decision Tree Learning – An implementation and improvement of the ID3 algorithm.* CS 695 – Final Report, Indiana State University, 2017.

[6] Dass R., Mukherjee A. and Banerjee S. *Student Java Online Documentation.* PGDSE – Advanced Java Project, Jadavpur University, 2013.

[7] Dass R., *Library Automated System.* PGDSE – Visual Basic.Net Project, Jadavpur University, 2013.

[8] Dass R., *Quantum Field Theory II.* PHYS 451 – Master of Physics Thesis, Lancaster University, 2013.

[9] Dass R., *The quantum theory of many interacting particles with an investigation into the jelly model of a degenerate electron gas.* PHYS 373 – Mini-project III, Lancaster University, 2012.

[10] Dass R., *Symmetry in quantum mechanics through group theory and its representations.* PHYS 372 – Mini-project II, Lancaster University, 2012.

[11] Dass R., *The variational method and applying the perturbation theory to derive the Fermi-Dirac Distribution.* PHYS 371 – Mini-project I, Lancaster University, 2011.