Rohit Mallick

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U.S. Citizen

FIELDS OF INTEREST

Brain and Behavioral Science, Cognitive Sciences, Neuroscience, Computational Neuroscience, Computer Science, Robotics, Machine Learning, Reinforcement Learning, Human-in-the-Loop Interaction, Biologically inspired computing

EDUCATION

08.2016 – 05.2020

PURDUE UNIVERSITY - WEST LAFAYETTE, IN
BS in Brain and Behavioral Sciences

- College of Health and Human Sciences
- Computer Science Minor

08.2014 – 6.2016

C. MILTON WRIGHT HIGH SCHOOL - BEL AIR, MD
High School Diploma

- Completed the Engineering Pathway curriculum coordinated by Project Lead the Way, a national program devised to introduce key concepts of engineering to high school students.
- Completed the Social Sciences Pathway curriculum

08.2012 – 6.2014

UNITED WORLD COLLEGE OF SOUTH EAST ASIA - DOVER CAMPUS, SINGAPORE
(I)GCSE Certificate

- The International General Certificate of Secondary Education was a 2-year program coordinated by Cambridge University, UK
- Classes included Extended Maths, English, Economics, History, Global Perspectives, Photography, Coordinated Sciences (Physics, Biology, Chemistry)

WORK HISTORY

01. 2017 - PRESENT   **HUMANITIES, SOCIAL SCIENCES AND EDUCATION LIBRARY – WEST LAFAYETTE, IN**
                            Student Assistant

- Patron assistance in library related activities such as book retrieval and customer service
- Library maintenance activities such as inventory and book reallocation
- Management related responsibilities in overseeing and training new student workers

RESEARCH EXPERIENCE

08. 2018 – PRESENT   **COMPUTATIONAL COGNITIVE NEUROSCIENCE LAB – WEST LAFAYETTE, IN**
                            Undergraduate Research Assistant

- Working closely with doctoral student, Pallavi Mishra, we devised a way to study subjects and apply their cognitive skills in a deep learning computational model of the 3D reconstruction of vision. I personally wrote the experiment in Python and accumulated data that Pallavi used to teach her deep learning model.
- Project lead on a reinforcement learning approach in solving the traveling salesman problem with Dr. Sébastien Hélie as my acting advisor.
- As part of my duties, I regularly proctor and administer NSF/IRB approved psychological studies for other graduate students in the lab.

07. 2019 – 09. 2019   **OAK RIDGE INSTITUTE OF SCIENCE AND EDUCATION – ABERDEEN, MD**
                            Journeyman fellow at U.S. Army Research Laboratory - Human Research and Engineering Directorate (ARL - HRED)

- Under the mentorship of Dr. Nicholas Waytowich, I created a 3D simulation of drones as a platform to demonstrate proof of concept ideas to minimize potential damage to real world drones.
- As a team, we addressed the issue of autonomous landing on a moving target. My main contribution included creating april tags and testing their efficacy in detection and acquisition of the autonomous agent. I also started to implement an imitation learning algorithm that would be used concurrently with other reinforcement learning tactics by the group.

05. 2018 – 08. 2018   **OAK RIDGE INSTITUTE OF SCIENCE AND EDUCATION – ABERDEEN, MD**
                            Summer Journeyman fellow at ARL - HRED

- Under Dr. Nicholas Waytowich we investigated human-in-the-loop reinforcement learning in regards to ground robots. Based on previous works of Dr. Waytowich and colleagues in reinforcement learning with atari bowling, I was able to apply his novel algorithm in an entirely new context of a physical ground robot.

- Also assisted others in the group in creating an imitation learning approach to promote the robot learning to execute certain processes.
- Established a multi-purposed testing environment for the ground robot

05. 2017 – 08. 2017	**COLLEGE QUALIFIED LEADERS – ABERDEEN, MD** **Summer student at ARL - HRED**

- Under the mentorship of Dr. Anthony Ries we questioned whether reaction time varies based on fixation onset asynchrony.
- To test this, I created a psychopy experiment in python in conjunction with a Tobii eye tracker to compile eye metrics with reaction time. Varying the perceptual difficulty with gabors and their respective spatial frequency.
- In this preliminary stage of research, we found that reaction time does vary as a function of stimulus onset asynchrony. However due to continually getting ceiling accuracy effects, it would be much more prudent to reduce accuracy to truly measure if there is an effect or not.

05. 2016 – 08. 2016	**OAK RIDGE INSTITUTE OF SCIENCE AND EDUCATION – ABERDEEN, MD** **Summer Journeyman fellow at ARL - HRED**

- Under the mentorship of Dr. Anthony Ries, Dr. Jon Touryan, and Dr. Brent Lance I was able to publish a paper on the use of eye metrics to index cognitive workload in video games.
- This summer was used to complete statistical analyses of the previous summer's data. These analyses included but are not limited to one-way ANOVA, standard error, t-tests, and more through Matlab.

06. 2015 – 08. 2015	**SCIENCE AND ENGINEERING APPRENTICESHIP PROGRAM – ABERDEEN, MD** **Summer student at ARL - HRED**

- Under the mentorship of Dr. Anthony Ries, Dr. Jon Touryan, and Dr. Brent Lance, I researched the relationship between eye metrics and cognitive workload.
- This project was a subset from an overarching exploration of the relationship between eye tracking and electroencephalography (EEG) for improvising visual search and user interfaces.
- I was personally responsible in structuring the code that processed the large amount of data and compiling it into a comprehensible format.

06. 2014 – 08. 2014	**SCIENCE AND ENGINEERING APPRENTICESHIP PROGRAM – ADELPHI, MD** **Summer student at ARL - Sensors and Electron Devices Directorate (SEDD)**

- Under the mentorship of Dr. William Nothwang, I joined a group focusing on developing an autonomous micro-quadcopter capable of surveillance and reconnaissance through SLAM mapping and more.
- Contributing to the group, I was tasked with testing various wifi modules to determine how frequency is related to radio propagation in various

environments. The aim being that the quadcopter continue on doing what it is doing in various environments such as the forest, or building and continue to transmit data.

PUBLICATIONS

Rohit Mallick, "Quantifying Visual Perception Before, Upon, and After an Eye Fixation" ARL-SR-0388, 2017 ARL Summer Student Program, Volume II: Compendium of Abstracts, Rose Pesce-Rodriguez, p. 95, Dec 2017.

R. Mallick, D. Slayback, J. Touryan, A. J. Ries, and B. J. Lance, The Use of Eye Metrics to Index Cognitive Workload in Video Games, DOI: 10.1109/ETVIS.2016.7851168, IEEE (2016)

Rohit Mallick, "The Use of Eye Metrics to Index Cognitive Workload in Video Games" ARL-TM-2016a, Volume II: Compendium of Abstracts, Army Research Laboratory, p. 31, 2016.

Rohit Mallick, "Correlations Between Tetris Fall Speeds and Eye Movement" ARL-TM-2015a, Volume II: Compendium of Abstracts, Army Research Laboratory, p. 35, 2015.

PRESENTATIONS

Rohit Mallick, Pallavi Mishra, Sébastien Hélie, "A Network for 3D Perception Using Psychophysical Constraints", CEREBBRAL Symposium, Purdue University, West Lafayette, IN, 17 April 2019

Rohit Mallick, Nick Waytowich, Derrik Asher, Brianna Henthorn, Brian Cesar-Tondreau "Human-in-the-Loop Reinforcement Learning in Ground Robots", ARL Summer Symposium, Human Research and Engineering Directorate (HRED), Army Research Laboratory (ARL), Aberdeen Proving Ground (APG), MD, 25 July 2018

Rohit Mallick, Anthony Ries, Jon Touryan, David Slayback "Quantifying visual perception before, during, and after an eye fixation", ARL Summer Symposium, HRED, APG, MD, 25 July 2017

Rohit Mallick, Anthony Ries, Jon Touryan, David Slayback, Brent Lance "The Use of Eye Metrics to Index Cognitive Workload in Video Games" IEEE – Vis (ETVIS), Hilton Baltimore, MD, 23 October 2016.

Rohit Mallick, Sherry Green, William Nothwang, "Range and Throughput Assessment of Wireless Radios in Various Environments", ARL Summer Student Symposium, Sensors and Electron Devices Directorate (SEDD), Adelphi, MD, 8 August 2014.

AWARDS

Presidents Award	(2012) (2016)
National Honor Society (NHS) Member	(2014 – 2016)
National Math Honor Society Member	(2016)

National Youth Achievement Award (Silver Medal)   (2014)

International General Certificates of Secondary Education   (2014)

Service Award for St. Joseph's Nursing Home   (2014)

EXTRACURRICULARS

IEEE Chapter Purdue : Computer Society   (2016 - 2020)

Neuroscience Society   (2019 - 2020)