Walid Abu Al-Afia

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Education

Rhodes College   Memphis, TN
Bachelor of Science, Computer Science. GPA 3.87   May 2023
Minor: Religious Studies
Awards and honors: Magna Cum Laude, Upsilon Pi Epsilon, Theta Alpha Kappa, Jack U. Russell Award, Joseph Reeves Hyde Award, Presdential Scholar, Dean's List, Honor Roll
Relevant Coursework: Parallel Systems, Distributed Systems, Operating Systems, Artificial Intelligence, Theory of Computation (Automata), Computer Organization, Programming Languages, Data Structures and Algorithms

King's Academy   Manja-Madaba, Jordan
High School Diploma. GPA 3.86   May 2019
Awards and Honors: Student Body President, Student Leadership Council Founder/President, President's Award for Outstanding Leadership
Relevant Coursework: AP Computer Science A, AP Physics 1, AP Calculus AB, AP English Language and Composition, AP English Literature, AP Macroeconomics, AP Microeconomics, AP Capstone Seminar, AP Art History, IGCSE A-Level Arabic

Study Abroad Scotch College   Perth, Australia
Study abroad coursework in third year of high school.   April 2016 September 2019
Part of the Round Square Program's Global Cultural Exchange.

Publications

S. Balali, M. Hudspeth, I. Afflerbach, H. Helgesen, J. McCurry, **W. Abu Al-Afia** et al., "Development and Evaluation of Exploratory Experiences to Facilitate Reasoning About Robotic Systems,"2023 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), Detroit, MI, USA, 2023, pp. 4107-4114, doi: 10.1109/IROS55552.2023.10342409.

Abstract: This paper introduces a novel interactive approach Exploratory Experiences that aims to improve the ability of people to reason about the capabilities and limitations of robotic technology. We focus on two areas: robot navigation and object detection. We evaluate the Exploratory Experiences with a novel approach that measures the participant's ability to predict when the robot will fail, following up with asking the reason and a possible fix. We show that our approach is effective at improving participants' understanding of potential robot navigation failures and that they already have the skills to detect potential object detection failures when presented with the correct stimuli.

Keywords: Navigation; Atmospheric measurements; Object detection; Particle measurements; Cognition; Intelligent robots; Explainable AI

URL: https://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=10342409&isnumber=10341342

<div align="center">**Experience**</div>

St. Jude Children's Research Hospital Memphis, TN
Computational Engineer I May 2023 – Present

- Built and maintains Open OnDemand instance on 20,000+ core cluster.
- Authored multiple OnDemand Interactive Applications (Maestro, VMD, Scipion).
- Handles all software/module installs on the cluster (RHEL7/RHEL8).
- Organizes and teaches seminars on HPC programming tools (Conda, containerization, Open OnDemand, Intro HPC).
- Optimizes/debugs parallel programs and helps researchers write scalable software.

Keywords: Python; Bash; C; Rust; Ruby; GCC; GNU; MPI; OpenMP; Virtual Environments; Conda; Open OnDemand; VNC; Virtual Desktop Manager; Parallel Programming; SPMD Programming; CUDA Programming; GPU Optimization; Data Distribution; Containerization; HPC; Environment Modules

St. Jude Children's Research Hospital Memphis, TN
High Performance Research Computing - Engineering Student September 2022 – May 2023

- Performed routine module installs on RHEL7 HPC Cluster.
- Built a metrics collection development environment utilizing a prometheus data source.
- Used Grafana dashboards to visualize metrics.
- Learned LSF from an admin perspective.

Keywords: LSF; Slurm; Linux Administration; Prometheus; Grafana

St. Jude Children's Research Hospital Memphis, TN
High Performance Research Computing - Intern June 2022 – August 2023

- Developed and built a VR application that delivers training to patients for Radiation Oncology treatments.
- Built and deployed a REST API endpoint running a renowned protein-protein complex structure prediction algorithm.
- Compiled documentation and knowledge base articles for other engineers on how to deploy endpoints to St. Judes in-house HPC clusters.

Keywords: Virtual Reality; Unity; Meta Interaction SDK; REST API; Web Endpoints; Protein Folding

Rhodes College Memphis, TN
Computer Science Tutor August 2020 – May 2023

- Tutored approximately 20 introductory computer science students in one-on-one weekly sessions.
- Created customized lessons and individualized help to ensure the best success for the student.

Keywords: Tutoring; Python; Java; C; Management; Data Structures; Algorithms; Systems

Rhodes College Memphis, TN
Computer Science Head Tutor September 2022 – May 2023

- Hired and managed a team of 9 tutors, assigned shifts, and facilitated communication between professors and tutors.
- Managed transition to in-person tutoring by helping establish TutoringBot: an application that manages student queues.

Keywords: Tutoring; Management; Leadership; API Requests; Raspberry Pi; Python; Java; C

Rhodes College   Memphis, TN
Cloud Application Student Administrator   May 2022 May 2023

- Managed and maintained cloud-based applications running on Google Cloud Platform, including JupyterHub Kubernetes cluster.
- Integrated cloud applications with OneLogin SSO.

Keywords: Jupyter; Jupyter Notebook; Jupyter Lab; Kubernetes; Google Cloud Platform (GCP); Slurm; HPC; OneLogin

Rhodes College   Memphis, TN
Robotic Grasping Research Fellow   January 2021 March 2022

- Served as an investigator, contributing to a published research project.
- Contributed as an author to a paper targeting publication in the International Conference on Social Robotics 2022.
- Designed AR application and accompanying set of user tasks to teach users about robot navigation using Laserscan.
- Conducted user study and investigated the effect of privacy in tele-presence robots/laser bots.

Keywords: Navigation; Atmospheric measurements; Object detection; Particle measurements; Cognition; Intelligent robots; Explainable AI

INTRASOFT Middle East   Amman, Jordan
Data Science Intern   June 2018 August 2018

- Created a Bitcoin trading bot based on the live price of Bitcoin.
- Learned how to effectively use application programming interfaces (APIs).
- Used Python and Java to program against RESTful APIs.

Keywords: Data Engineering; Data Science; API; RESTful API; REST API; Python; Java

Leadership & Activities

Rhodes College Student Government   Memphis, TN
Class Council Treasurer and Vice President   November 2019 May 2021

- Used Microsoft Excel to compile budgets for all events planned by the Class Council.
- Organized and supervised class-wide and school-wide events for students.
- Worked directly on vendor planning and recruitment.
- Planned and managed Rhodes College Homecoming 2019 and 2020.

Skills & Interests

Technical: Python, C/C++, Java, Go, Rust, R, Ruby, Bash, HTML, CSS, JavaScript, React.js, Racket
Language: English (native), Arabic (native), French (working proficiency), Spanish (working proficiency)
Tools: Bash, Vim, Emacs, VSCode, RStudio, Jupyter, IntelliJ Suite, MS Office, Open OnDemand
Interests: High-Performance Computing, Software Engineering, Compiler Design, Parallel Programming
Hobbies: Reading, Guitar, Cats, Coffee, Keyboards, Gaming