Arun Krishnavajjala

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EDUCATION

Ph.D. Computer Science (GPA 3.9/4) — Fairfax, VA | Sept 2021 - Present
George Mason University

M.S. & B.S. Computer Science (GPA 3.7 & 3.5) — Fairfax, VA | Jan 2021 / Dec 2020
George Mason University

RESEARCH INTERESTS

My research goal is to enhance data-driven software accessibility through cutting-edge deep learning and computer science research, by building innovative developer tools. I aspire to collaborate with leading research labs to make these tools widely available to developers worldwide.

WORK EXPERIENCE

GEORGE MASON UNIVERSITY | Graduate Research Assistant — Fairfax, VA | May 2021-Present

- Worked under Dr. Kevin Moran with the SAGE Lab and conducted a comprehensive literature survey of the field to identify research gaps in Android app accessibility for motor-impaired users.
- Designed and implemented MIRACLE, an automated tool to detect motor-impairment accessibility issues in mobile applications using **Java** and **Python** programming languages
- Integrated state-of-the-art techniques in **PyTorch computer vision**, **pattern-matching**, and **static analysis** to detect various accessibility violations through application screenshots and XML data
- Achieved an **87%** accuracy rate for MIRACLE when detecting accessibility guidelines at runtime, validating the reliability of the tool for developers to test their applications
- Submitted findings at MSR '23, a top international conference for software testing and analysis

ALCON | Research & Design Intern — Fort Worth, TX | May 2021-Aug 2021

- Collaborated with a multi-disciplinary team of researchers and surgeons to prototype a surgical voice assistant
- Lead the design team for a wake-word model for surgical voice assistants, utilizing **TensorFlow**, **AWS SageMaker**, **AWS S3**, and pioneering research in voice assistant technology, given surgery requirements
- Developed a pipeline for audio processing and feature extraction using **Python**, **Librosa**, and **PyAudio**, and trained a **deep learning** model using **PyTorch** to classify windowed audio and detect the wake-word, "Hey, Alcon".
- Achieved an **80%** accuracy o rate for wake-word detection in an input stream, exceeding expectations, and deployed the prototype to operating room devices across the United States

INTERNATIONAL SOFTWARE SYSTEMS | Software Engineer Intern — Maryland | May 2020-Aug 2020

- Spearheaded development of a mission-critical project to improve doctor-patient communication at hospitals
- Built a series of **REST APIs** using **Node Js** back-end, **React** front-end, and **MongoDB** database
- Lead weekly **SCRUM** meetings with **international teams** and delivered timely, high-quality software to production

PROJECTS

ACCESSIBILITY DEVELOPER TOOLS LIT REVIEW — Collaborative Research
Conducting a literature review on developer tools that improve accessibility of traditional software systems (web/mobile/desktop) for users with disabilities, and enable developers to create more accessible software.

DIABETIC RETINOPATHY IMAGE CLASSIFICATION — Python, PySpark, TensorFlow, Databricks
Performed a multi-level classification on images of retinas to determine diabetic retinopathy severity. Built using **16gb** of data, **AWS EMR**, and **EC2**, achieving **97% accuracy**

STUDENT SURVEY TOOL — Java, Jenkins, Angular, Kubernetes, Maven, AWS EC2, Spring
Developed a GMU-backed survey using **Angular** and **Spring**. Deployed the **Dockerized** project to **EC2** using **Jenkins CI/CD**. Hosted on a **Kubernetes** cluster for scalability while leveraging **Apache Kafka** to manage micro-services

SKILLS

Languages: Java, Python, C, SQL, Swift, R
Technology: AWS, Android, Docker, Apache, LaTeX, MongoDB, DynamoDB, FireBase, Kubernetes, Jenkins, Hadoop, DevOps, Unix, Git