Rishi Pathak

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Education

Georgia Institute of Technology — Atlanta, GA
Bachelor of Science in Computer Science — GPA: 3.88 — *Aug 2020 - May 2023*

Experience

Computer Vision Research Assistant — Aug 2021 – Present
Rehg Lab @ Georgia Institute of Technology — *Atlanta, GA*

- Researching novel computer-vision models that can understand non-verbal communication cues such as gaze, gestures, posture, and facial expressions.
- Implemented rigid-euclidean and affine transformations to adapt mobile native neural network architectures to traditional computer settings.
- Wrote neural-network architecture in PyTorch to generate saliency maps from video.

Mathematics Research Assistant — May 2020 – May 2021
Department of Mathematics @ Georgia Institute of Technology — *Atlanta, GA*

- Worked under Dr. Heinrich Matzinger to determine the infection fatality rate of the first wave of COVID-19.
- Parsed mortality and infection data from 45+ local and international databases using the requests library.
- Visualized infection fatality rates through 30+ models stratified by age, sex, and location through matplotlib, numpy, and pandas.
- Extrapolated inferences about the COVID-19 mortality for 11+ countries across the world.

Projects

Invasive Identifier | *Swift, SwiftUI, Firebase, Python* — Jun 2021 – Present

- Developing an iOS-based app that recognizes invasive plant species in pictures through the use of neural networks.
- Project selected by the Kendeda Building Advisory Board for full funding on an as needed basis, with initial valuation of $500, as part of Georgia Tech's microgrant program.

Self Driving RC Car | *Python, OpenCV, PySerial, Numpy, C, Linux* — May 2021 – Aug 2021

- Converted a regular RC Car to an vision based self-driving car with a Raspberry Pi, Arduino, and piCamera.
- Diagrammed and implemented circuitry using Fritzing software and basic electronic components.
- Wrote C code for precise servo and dc motor control with an Arduino.
- Engineered a UART based protocol with the pySerial library for communication between the Pi and Arduino.
- Implemented Canny Lane Detection and Hough Line Transform algorithms for path calculation onboard the Pi.

iHeard | *Python, PyTorch, Flask, Jupyter Notebook, API, JavaScript, HTML, CSS* — Dec 2020 – Jan 2021

- Lead the development of a web app to assist the hard of hearing navigate urban environments through automatic sound classification.
- Implemented and trained a CNN with over 68% accuracy on the UrbanSound Dataset which featured over 8,000 sounds belonging to 10 distinct classes.
- Integrated Google Cloud services for real-time speech-to-text translation.

LikeMySong | *Python, Pandas, Scikit-Learn, PyTorch, Spotify API* — Nov 2020 – February 2021

- Leading the creation of a music recommender system with a team of eight other programmers.
- Scraped metadata for every known genre indexed by Spotify (three million+ songs in total) using the Spotify API.
- Implemented clustering algorithms (birch, agglomerative, k-means) using scikit-learn to generate song/genre similarity representations. Clustered 5000+ genres into 1000 automatically calculated similarity categories.

Technical Skills

Languages: Python, C, Java, Bash, Assembly, Swift, HTML/CSS, LaTex, SQL
Developer Tools: Git, Docker, Google Cloud Platform, Linux, VS Code, PyCharm, IntelliJ, Amazon Web Services
Libraries: OpenCV, Numpy, Pandas, Pytorch, Requests, Matplotlib, Sklearn, Pyserial
Hardware: Arduino, Raspberry Pi, piCamera, AVR MCU's, Fritzing

Awards

Research Grant Awardee - *Kendeda Building Foundation* - Collegiate - *2021*
National Merit Scholarship Winner - *National Merit Corporation* - National - *2020*
Think Award Finalist - *FIRST Robotics World Championship* - International - *2017*