SAAD **RANA**

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EDUCATION

2016 – 2020 MEng Engineering Science – 2.1 | University of Oxford, Keble College

- **Software:** Algorithms and Data Structures, OOP (C++), Operating Systems, Networks
- **Information:** Machine Learning, Computer Vision, Robotics, Optimisation

2014 – 2016 SQA Qualifications | Hillpark Secondary, Glasgow

- **Advanced Highers:** Maths A, Physics A, Chemistry A **Highers:** Computing Science A, Biology A, English B
- **Awards:** Excellence in S6 for being the best academically performing student in the year.

EXPERIENCE

Aug – Sep 2020 Computer Vision Intern| Archangel Imaging

- Increased object detection and classification range of an AI powered camera.

June 2020 Web Development Intern | Modux

- Developed a login page using React and Flask, investigating interesting ways to securely login.
- Implemented a rhythmic password using the timings between each keystroke. This was secured using Bcrypt hashing.
- An eigenfaces approach was used to implement melody detection as a form of memorable information for the page.

PERSONAL DEVELOPMENT

July 2018 CUDA Programming Course | University of Oxford

- Topics Covered: Warp shuffles, Control flow, Synchronization, Memory Management, OpenMP

Oct 2020 Coding Certificates | FreeCodeCamp

- JavaScript Algorithms and Data Structures Certification
- Responsive Web Design Certification

PROJECTS

Personal Website – saadrana.co

- Utilised React hooks to interface traditional javascript libraries with React such as GSAP and Fullpage.js
- Leveraged react-router-dom hooks to provide custom transition animations between specific pages

Lensless Camera and Wavefront Sensor

- Built a lensless camera by replacing the lens with a diffuser, and then used a machine learning algorithm to reconstruct images.
- Trained a Siamese Network using PyTorch to classify aberrations detected on the lensless camera.

To-do List Web App

- Implemented React Context API using hooks, to centralise state and methods into a single store to avoid props drilling.
- Designed a REST API linked with MongoDB, to deal with CRUD requests.
- The React Context API was replaced by Redux after the introduction of Redux hooks.
- Utilised: JavaScript, HTML/CSS, React, Axios, Express, Mongoose, MongoDB, Redux

Timeseries Forecasting of Building Power Usage

- Predicted average electrical power usage of a building using Long Short-Term Memory neural networks (LSTM) and Support Vector Regression (SVR) in Python, utilising meteorological & historical usage data.
- Utilised: Python, Keras, Scikit-Learn, Numpy, Pandas, Excel, Darksky API

Modular CHP Control System

- Designed and implemented a PID controller for a Combined Heat & Power Generator (CHP) to allow load tracking.
- Developed a scheduler to efficiently split the load amongst the CHPs, minimising the fuel usage using non-linear programming.

AR Overlay

- Projected video content on an image detected from a camera feed using OpenCV.

SKILLS & ACTIVITIES

- **Software:** (Proficient): Python, JavaScript, HTML/SASS, React, FIgma (Familiar): C#, Java, C++, MATLAB, Docker
- **Languages:** (Native): English (Elementary): Spanish
- **Activities:** I am currently learning UX design. My other interests include playing video games such as VALORANT and Genshin.