MUKUL RATHI

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EDUCATION

2017-2020 **Queens' College, University of Cambridge**
Studying for B.A. (Hons.) Computer Science
2013-2017 **Nottingham High School**
A Levels - Mathematics (A*), Further Mathematics (A*), Physics (A*), Chemistry (A*)
GCSES - 11 A*s and an A (top grade) in FSMQ Additional Maths

PROGRAMMING LANGUAGES:

Java, Python, Standard ML, SQL, Matlab,

RELEVANT EXPERIENCE/SKILLS

November 2017 **OxfordHack – DeepDoc:**

- Built an application to help doctors diagnose complicated diseases
- Used Pandas to pre-process the dataset and TensorFlow to design a neural network to classify the disease as one of 16 classes based on the quantitative patient data.
- Achieved a test accuracy of 64.7% despite a small dataset of only 471 examples, with missing features.
- Ranked in the top 15 teams (out of 58). I led the presentation given to the judges.

July-August 2016 **Deep Learning Research Placement:** *Computer Vision Lab, University of Nottingham*

- Segmented images as part of the Gestate Gates Foundation research project by training a Fully Convolutional Network in Caffe – supervisor described results achieved as "state-of-the-art".
- Read research papers in the field of computer vision in order to select the best model and thus improve the performance of the deep learning algorithm.
- Used Matlab to pre-process and also visualise the data.

December 2017 **Cambridge Gaming Gig Hackathon – Retro Game Design**

- Used Lua and the Löve platform to design a horizontal shooter game using characters from Mario.

September 2017 **Personal Project – Deep Learning for Chemistry (Molecule Energy) Prediction:**

- Achieved a Root Mean Square Error of only 3.708, significantly better than the original research paper's RMSE of 36.63 by implementing a neural network using Numpy.
- Implemented advanced optimisation techniques (such as Batch Normalisation and Adam optimiser) from scratch.

August 2017 **Personal Project - Credit Card Fraud Detection:**

- Achieved an F1 score of 0.70 by using a neural network implemented from scratch using Numpy to classify credit card transactions as fraudulent or not.

2013-2014 **VEX Robotics Team Competition – Lead Programmer:**

- **2013** – Qualified for International Finals and were one of only 3 teams nationally to receive an Excellence Award at Regional Finals.
- **2014** – National Champions in the Programming Skills and Robot Skills competitions and 2nd nationally in main competition. Reached Quarter finals of division at International Finals – the best ever performance by a UK team.

SKILLS / ACTIVITIES

- **2015-2016** - Volunteered at local leisure centre - led the weekly junior badminton session
- **2014** – Mentored younger students competing in the VEX Robotics competition – a few of these students went on to be part of the National Champions team the following year.

ACADEMIC AWARDS

- **2017** – Qualified for Round 2 of the UK Chemistry Olympiad (for top 30 students nationally).
- **2016** – Came 2nd nationally in the Cambridge Lower Sixth Chemistry Challenge - invited to attend a camp at St. Catharine's' College Cambridge for the top 55 students nationally.
- **2015** – Awarded the Arkwright Engineering Scholarship –only ~400 awarded nationally.
- **2014** – Invited to UKMT Leeds Maths Summer School (for top 40 Year 10 and 11 students nationally) and one of 20 students selected for the UKMT Oxford Initial Training camp.