Eklavya Sarkar

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EDUCATION

MSc Data Science with Placement, *University of Bath* - *UK* **Oct 2018-Present**
Current Overall Grade: First Class (74%)
- Dissertation: Facial Detection, Recognition & Emotion Classification
- Selected Modules: Machine Learning I & II, Statistics, Reinforcement Learning, Applied Data Science

BSc Computer Science, *University of Liverpool* - *UK* **2015-18**
Overall Grade: First Class (70%)
- Dissertation: Kohonen Self-Organizing Maps, *Grade: 90%*
- Selected Modules: Artificial Intelligence , Group Software Engineering, Complexity of Algorithms, Networks

PROFESSIONAL EXPERIENCE

CERN, CMS Experiment - Python, C++, CERN's ROOT **July-Sept 2017**
Software Engineering and Data Analysis Intern *Geneva, CH*
- Refined efficiency of production code by implementing requested features and enhancements on Python scripts.
- Improved code used for testing detector in a quality control stand by adding an optional step-size argument feature.
- Created method for configuring detector's electrical state with custom values by employing a Python dictionary.
- Published real-time gas levels of a mixer by writing C++ script to collect and send data to a shared server via an API

RESEARCH AND THESIS

Computer Vision: Facial Recognition & Emotion Classification - TensorFlow, Python, NumPy **2012-13**
- Built 3 models for each task using personal database of images before combining them all into an end-to-end model.
- Improved performance with deep learning best practices: data augmentation, batch-normalisation, cross validation.
- Achieved 95% final test accuracy with convolutional neural networks and extensive hyper-parameter tuning.

Computer Vision: Kohonen Self-Organizing Maps - EMNIST, Python, Flask, D3.Js, Bootstrap, HTML **2017-18**
Grade: 90%
- Implemented unsupervised machine learning neural network from ground up without using any specific ML library.
- Trained back-end model on 3 open-source datasets of various dimensions to cluster data using Kohonen's algorithm.
- Developed front-end GUI for interactive data visualisation before and after clustering and dimensionality reduction.
- Wrote 200 pages thesis covering all aspects of project such as system design, algorithmic optimisation, scalability.

ACADEMIC PROJECTS

Deep Reinforcement Learning: Flappy Bird - Python, TensorFlow, NumPy **April 2018**
- Trained model to learn to play Flappy Bird using Deep Q-Learning, and surpassed human level performance.
- Implemented model with Experience Replay and Deep Deterministic Policy Gradients to develop optimal policy.

Natural Language Processing: Toxic Comment Classification - Python, NumPy, Pandas **April 2018**
- Attempted to solve Kaggle competition while specifically striving for implementations beyond *off-the-shelf* ones.
- Compared different ML approaches as Log Regression, Decision Trees, LSTM with a baseline Naive-Bayes model.

Natural Language Processing: Open Information Relation Extraction - Python, NumPy, Pandas **April 2018**
- Summarised large body of text by training a ML speech tag classifier for each input word using Glove word vectors.
- Optimised kitchen sink model by implementing features such as backtracking, Vertibi algorithm, Adam optimiser.

Group Android App Project - SQL, PHP, JavaScript, AJAX, jQuery, CSS, HTML **Feb-June 2017**
Grade: 75%
- Created Scran, a dynamic Android food app, which analysed user's data to suggest dishes based on past preferences.
- Focused on back-end by handling database, maintaining data pipelines and writing SQL queries for data retrieval.
- Developed final App to a total of 30 different pages with approximately 200 lines of code for each view.

SKILLS

- **Languages**: Python, Java, Javascript, PHP, C++, SQL, Tex, CSS, HTML.
- **Frameworks/libraries**: TensorFlow, SkLearn, NumPy, Pandas, Matplotlib, Seaborn, OpenCV, D3.js.
- **Softwares**: Jupyter, Xcode, IntelliJ IDEA, Eclipse, Matlab, MySQLWorkbench, LabVIEW, Mathematica.
- **Comfortable with**: Git, Github, Linux, Unix, Shell, Emacs, Databases, Mattermost.
- **Spoken Languages**: English, French, Hindi (fluent), German (working proficiency).

LEADERSHIP EXPERIENCE

President, Dover Court Hall Students Committee, University of Liverpool **2017-18**
- Elected President of Dover Court Hall Committee by ballot vote majority to represent 270 students.
- Enhanced residents' experience by taking charge of implementing and managing events throughout the year.
- Led 10 member committee through generating team vision, chairing weekly meetings, and gathering feedback.