Eklavya Sarkar

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Nationality: Swiss (of Indian origin)
Date of birth: 01.09.1994

Github: www.github.com/EklavyaFCB
Portfolio: https://eklavyafcb.github.io

Curriculum Vitae

EDUCATION

- BSc Computer Science (Hons), *University of Liverpool* **2015-2018**
  Bachelor Project: Kohonen Self-Organising Maps (**Interim Grade: A+**)
- BSc Mechanical Engineering, *Ecole Polytechnique Fédéral de Lausanne* (Uncompleted) **2013-15**
- High School: Swiss Federal Maturity Certificate, *CEC André-Chavanne*, Geneva, CH **2009-13**
  Elective subjects: Physics and Applications of Mathematics (**Grade: 5.0/6.0**)
  Advanced Mathematics (**Grade: 4.5/6.0**)
  Chosen project: Research on Exoplanets (**Grade: 6.0/6.0**)

WORK EMPLOYMENT

- **CERN, CMS Experiment, Internship**, July - Sept 2017:

  Data analysis: Installed and learnt Cern's ROOT C++/Python CLI framework to understand *tree* and *n-tuple* data structures, and used them to plot, fit and cut particles physics events such as collisions and trajectories on histograms.

  Software development: Implemented requested features on an existing central code repository, relating to GEM detector's hardware, using Python scripts, and tested them on a Cosmic Stand (QC8) while maintaining detailed e-logs of results. Also used Cern's DIP Server API documentation to write a C++ script on Visual Studio which constantly published the latest gas levels of a gas mixer using a .txt file generated from FlowPlot, FlowView and FlowDEE2 softwares, to a common server.

  R&D: Used a LabVIEW interface connected to a pico-ammeter and radiation stand to get and plot various data relating to irradiated GEM detector foils of various thicknesses in order to observe and understand relationship between X-Ray energies, electrical current, foil properties and the subsequently varying amount of particles detected.

ACADEMIC PROJECTS

- **Kohonen Self-Organising Maps (**Bachelor Project): Developed artificial neural networks which output topological maps using Kohonen's unsupervised machine learning algorithm, with Iris and EMNIST datasets as training input data. Implemented back-end in Python using NumPy, Pandas, Matplotlib, and front-end with JavaScript's D3 Library. Main challenges in algorithmic optimisation, data visualisation and connecting both ends through Python's Flask web-development framework. Additionally wrote thesis on topic discussing the model in depth and presenting insights on its properties, along with the specifications, design and implementation of the software. Final dissertation 18000 words/191 pages. September 2017 till May 2018. **Design document grade: A+**
- **Android Food App Group Project**: Developed *Scran*, an extensive Android app which allows users to choose suggested restaurants based on their taste, location, and previous ratings and comments on dishes or restaurants. Designed, implemented and populated database on University server, and linked it to the front-end's JavaScript via PHP, mySQL queries, jQuery and AJAX. Final product included 30 different views with around 300 lines of code each. 2017. **Grade: 75%**
- **CERN Presentation**: Selected to present on stage my research project on *Exoplanets* at the *Colloque Transfrontalier: La Science en Partage* (a public 'Science Sharing' event) at CERN's *Universe of Particles* museum. Geneva, October, 2013.

- **Exoplanets: Discoveries and prospects**: Research project on Exoplanets, with inputs from Dr. Didier Queloz, co-discoverer of the first exoplanet, Professor of Astrophysics, University of Cambridge. I conducted a literature review on the topic, analysed publicly accessible scientific datasets on exoplanets that held promise of supporting life, and created graphs with relevant parameters to highlight their correlation them with some fundamental laws of physics. Goal was to explain the importance of the discoveries and meaning of the search for exoplanets and its prospects. Wrote 15000 words/50 pages final report. June 2012 till Feb 2013. **Grade: 6/6**

IT PROJECTS

- **Robotics**: Implemented exploration, mapping, navigation and pathfinding on a robot using Java's LeJOS framework and A* search algorithm, to move it from an arbitrary start to end location inside a bounded arena, while avoiding randomly placed obstacles using ultrasound sensors and intelligent autonomous behaviours. 2017. **Grade: 76%**
- **Java Server**: implemented a chat server and client programs, that assessed object-oriented design, multithreading, synchronised methods, networking, I/O and graceful exception handling. The main scope of the program was to be able to listen, handle, respond and broadcast various simultaneous user connections while maintaining a log on the server side. 2016.
- **Facebook Hackathon**: Developed idea, structure and UI of an on-the-go revision app, implemented only with Swift. Goal to give students an interactive platform to revise and prepare for exams by giving them specific prepared content *tailored* to the common first-year Bachelor courses at EPFL. By providing feedback using statistics, mission was to pass down insights and tips to future students in order to improve the low student pass rate at EPFL. 2015.
- **Moving Average Filter:** wrote C++ in Xcode to generate random plot and noise values of a sinusoidal function using signal characteristics as parameters, which would then be handled by the designed event driven panels and data structures in LabVIEW, and subsequently transferred to Matlab to be displayed in both filtered and unfiltered states. Main challenge was to handle the many data I/O flows linking the three softwares. 2014. **Grade: 5.5/6**

EXTRA-CURRICULAR

- **President of Hall Students Committee**, University of Liverpool, Oct 2017 - Present:

  Elected President of a University of Liverpool Residence Hall Committee for the 2017/18 academic year by ballot vote majority. Main objective to represent and improve students experience, by using allocated budget to organise activities and events for all **270** accommodation's residents.

  - Responsible for formulating outline and implementation of vision for Hall's community and life.
  - Prepare and chair regular meetings to efficiently organise events and improve using feedback.
  - Maintain professional relationship with residence staff, guild of students, accommodation office and the university.

IT SKILLS (From fluent to familiar, for each line)

- **Languages**: Python, Javascript, Java, PHP, C++, SQL, Tex, CSS, HTML, Perl, C#, Prolog.
- **Frameworks or libraries**: NumPy, Pandas, Matplotlib, Flask, D3.js, jQuery, Cern's ROOT, LeJOS.
- **Softwares**: Matlab, MySQLWorkbench, LabVIEW, Mathematica, Xcode, IntelliJ IDEA, Eclipse, Unity3D, LaTeX, Adobe Illustrator, Affinity Designer.
- **Comfortable with**: Linux (SLC6, Xfce, Ubuntu), Unix, Shell, Emacs, Git, Databases.

LANGUAGES

- **Fluent**: English, French, Hindi. Working proficiency: German.
- University of **Cambridge** Examinations: *Certificate in Advanced English (CAE)* **Grade: A**