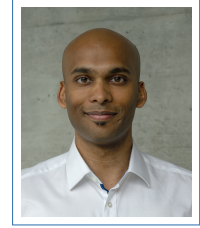


# Eklavya Sarkar

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Nationality: Swiss



## Research Interests

Deep Learning, Speech Processing, Computer Vision

## Work Experience

- 2021–Present **Research Assistant**, *Idiap Research Institute*, Martigny, CH  
Supervisor: Dr. Mathew Magimai Doss, Senior Researcher, Speech and Audio Processing
- Topic: Audio Segmentation Methods for Analyzing Vocal Communication.
  - Project: Swiss National Science Foundation's *NCCR Evolving Language*.
- 2020 – 21 **Research Intern**, *Idiap Research Institute*, Martigny, CH  
Supervisor: Dr. Sébastien Marcel, Senior Researcher, Biometrics Security and Privacy
- Investigated vulnerabilities of modern facial recognition systems against deepfake attacks.
  - Implemented additional losses to StyleGAN2 to generate identity-conserving morphs.
- 2017 **Intern**, *CERN*, Geneva, CH  
Supervisor: Dr. Archana Sharma, Principal Scientist, CMS Experiment
- Refined production code efficiency by implementing features on data acquisition tools.
  - Contributed to open-source data acquisition tools and radiation physics R&D experiments.

## Education

- 2021–Present **PhD Machine Learning**, *Ecole Polytechnique Fédérale de Lausanne*, CH.
- 2018 – 19 **MSc Data Science**, *University of Bath*, UK, Distinction.
- 2015 – 18 **BSc Computer Science**, *University of Liverpool*, UK, Distinction.

## Publications

- Interspeech **Sarkar et al.**, *Unsupervised Voice Activity Detection by Modeling Source and System Information using Zero Frequency Filtering*, 2022.
- ICASSP **Sarkar et al.**, *Are GAN-based Morphs Threatening Face Recognition?*, 2022.

## Thesis

- MSc **Optimising Facial Information Extraction and Processing using Deep Learning**  
Grade: Distinction
- BSc **Unsupervised Learning: Kohonen Self-Organizing Maps**  
Grade: Distinction
- TM **Exoplanets: Discoveries and Prospect**  
Grade: Distinction

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## Academic Projects

### NLP **Toxic Comment Classification**

- Attempted to solve Kaggle competition with beyond *off-the-shelf* implementations.
- Compared approaches such as Log Regression, Trees, LSTMs with baseline Naive-Bayes.

### RL **Flappy Bird Deep Q-Learning Network**

- Trained model to play Flappy Bird using a DQN, and surpassed human level performance.
- Refined optimal policy with Experience Replay and Deep Deterministic Policy Gradients.

### NLP **Open Information Relation Extraction**

- Summarised body of text by training a ML speech tag classifier using Glove word vectors.
- Improved model by coding backtracking, Viterbi algorithm, Adam optimiser from scratch.

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## Leadership Experience

2017–18 **President**, *Dover Court Hall Students Society*, University of Liverpool

- Elected President of Dover Court Halls by ballot vote majority to represent 270 students.
- Led 10 member committee by chairing weekly meetings, generating team vision.
- Enhanced residents' experience by managing events throughout the year.

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## Awards

Aug 2020 **International Create Challenge**, *3rd Prize*, AI-Hackathon  
Adversarial Attack Detection and Model Robustness

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## Talks

Nov 2020 Vulnerability Analysis of Face Morphing Attacks from Landmarks and GANs, *Idiap*  
Institute Presentation

Oct 2013 Exoplanets: Discoveries and prospects, *CERN*, Colloque Transfrontalier TPE-TM  
Invited Speaker

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## Programming Skills

Languages Python, Java, Javascript, PHP, SQL, C++, C#, Tex, HTML, CSS.  
Frameworks PyTorch, TensorFlow, Keras, SkLearn, D3.js.  
Misc. Git, Unix, SGE, Jupyter, Kaggle, Colab, xCode, Eclipse.

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## Languages

Fluent English, French, Hindi.  
Intermediate German.