Eklavya Sarkar

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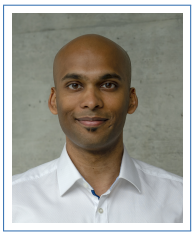

Research Interests

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: Inference of symbolic structure in speech and audio given minimal supervision.
- Project: SNSF's NCCR Evolving Language, Technology Transversal Task Force, ASR.

2020 - 21 **Research Intern**, *Idiap Research Institute*, Martigny, CH
Supervisor: Dr. Sébastien Marcel, HOD Biometrics Security and Privacy

- Investigated vulnerabilities of modern facial recognition systems against morphing attacks.
- Implemented additional losses to StyleGAN2 to generate identity-conserving morphs.

2017 **Intern**, *CERN*, Geneva, CH
Supervisor: Dr. Archana Sharma, Principal Scientist, CMS Experiment

- Improved data aquisition tools, and focused on radiation physics R&D experiments.
- Refined production code efficiency by implementing requested features on Python scripts.

Education

2021* **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

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, Vertibi algorithm, Adam optimiser from scratch.

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.

Awards

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

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

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.

Languages

Fluent English, French, Hindi.
Intermediate German.