

Swapnil Bhosale

📧 [swapb94.github.io/](https://github.com/swapb94) | 🏠 Guildford, UK
☎ +447833862119
✉ s.bhosale@surrey.ac.uk
✉ vbhosale.bhosale@gmail.com
🌐 [linked.in/swapnil-bhosale](https://www.linkedin.com/in/swapnil-bhosale) | 📄 [G Scholar](#)

Research Interests:

Audio-Visual Correspondence learning,
Novel View Synthesis, LLMs

EDUCATION

University of Surrey - People Centred AI Institute

PhD - Vision, Speech, Signal Processing

Focus: Audio-visual Segmentation and Separation, Diffusion-based Sound Event Detection.

United Kingdom

Sep. 2022 – Present

Walchand College of Engineering

Bachelor of Technology in Computer Science and Engineering

Thesis: End-to-End Spoken Language Understanding

India

May 2015 – May 2019

RESEARCH EXPERIENCE

Researcher - Speech and NLP Team

TCS Research and Innovation

- Robust Audio Event Detection systems for non-stationary distributions.
- Fusing multimodal cues for Emotion recognition.
- Pathological Speech Processing: Automated Intelligibility Assessment.

Aug. 2019 – Sep. 2022

Mumbai, India

Research Intern - Speech and NLP Team

TCS Research and Innovation

- End-to-End Spoken Language Understanding (SLU) for low-resource scenarios.
- SLU Domain adaptation for disordered speech.

Jan. 2019 – May 2019

Mumbai, India

Machine Learning Intern

Chainrule.ai

- Neural approaches for chest X-ray cancer detection and segmentation.
- Brain tumor segmentation.

Mar. 2018 – Sep. 2018

Remote

PUBLICATIONS - CONFERENCES

1. **Bhosale, Swapnil**, Sauradip Nag, Diptesh Kanojia, Jiankang Deng, and Xiatian Zhu. DiffSED: Sound Event Detection with Denoising Diffusion. In *Association for the Advancement of Artificial Intelligence (AAAI) 2024* ([link](#))
2. **Bhosale, Swapnil**, Haosen Yang, Diptesh Kanojia, and Xiatian Zhu. Leveraging foundation models for unsupervised audio-visual segmentation. *IEEE/CVF International Conference on Computer Vision (ICCV) Workshop: AV4D*, 2023 ([link](#))
3. **Bhosale, Swapnil**, Rupayan Chakraborty, and Sunil Kumar Kopparapu. Text-to-audio grounding based novel metric for evaluating audio caption similarity. In *IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP) 2023* ([link](#))
4. **Bhosale, Swapnil***, Upasana Tiwari*, Rupayan Chakraborty, and Sunil Kumar Kopparapu. Contrastive Learning of Cough Descriptors for Automatic COVID-19 Preliminary Diagnosis. In *Special Session DiCOVA at Interspeech 2021* ([link](#))
5. **Bhosale, Swapnil***, Upasana Tiwari*, Rupayan Chakraborty, and Sunil Kumar Kopparapu. Deep Lung Auscultation Using Acoustic Biomarkers For Abnormal Respiratory Sound Event Detection. In *IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP) 2021* ([link](#))

6. **Bhosale, Swapnil**, Rupayan Chakraborty, and Sunil Kumar Kopparapu. Deep Encoded Linguistic and Acoustic Cues for Attention Based End to End Speech Emotion Recognition. In *IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP) 2020* ([link](#))
7. **Bhosale, Swapnil**, Imran Sheikh, Sri Harsha Dumpala, and Sunil Kumar Kopparapu. End-to-End Spoken Language Understanding: Bootstrapping in Low Resource Scenarios. In *Interspeech 2019* ([link](#))
8. Ayush Tripathi, **Bhosale, Swapnil**, and Sunil Kumar Kopparapu. Improved Speaker Independent Dysarthria Intelligibility Classification Using Deepspeech Posteriors. In *IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP) 2020* ([link](#))
9. Ayush Tripathi, **Bhosale, Swapnil**, and Sunil Kumar Kopparapu. A Novel Approach for Intelligibility Assessment in Dysarthric Subjects. In *IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP) 2020* ([link](#))
10. Ayush Tripathi, **Bhosale, Swapnil**, and Sunil Kumar Kopparapu. Automatic Speech Intelligibility Assessment in Dysarthric Subjects (Demo). In *The Fourteenth International Conference on Digital Society. IARIA, 2020* ([link](#))

JOURNAL PAPERS

1. **Bhosale, Swapnil**, Rupayan Chakraborty, and Sunil Kumar Kopparapu. Calibration free Meta learning based approach for Subject Independent EEG Emotion Recognition. In *Biomedical Signal Processing and Control 2022*. ([link](#))
2. Ayush Tripathi, **Bhosale, Swapnil**, and Sunil Kumar Kopparapu. Automatic Speaker Independent Dysarthric Speech Intelligibility Assessment System. *Computer Speech & Language*, 69, 2021 ([link](#))

PATENTS - FILED

1. **Bhosale, Swapnil**, Rupayan Chakraborty, and Sunil Kumar Kopparapu. Methods and Systems For Building A SemiSupervised Few-Shot Model. Indian Provisional Patent Ser. No. 202021034689, filed 12 August 2020
2. Tripathi, Ayush and **Bhosale, Swapnil** and Kopparapu, Sunil Kumar. Methods and Systems For Assessment of Speech Intelligibility in Dysarthric Subjects. Indian Provisional Patent Ser. No. 202021008649, filed 28 February 2020

TECHNICAL SKILLS

Languages: Python, R, Java, C/C++, JavaScript, HTML/CSS
Deep learning Toolkits: PyTorch, Keras, Tensorflow
Frameworks: Flask, Django
Developer Tools: Git, PyCharm

TEACHING EXPERIENCE

EEEM066: Fundamentals of Machine Learning – Lab Fall 2023
 • Linear Algebra, Neural Networks, Machine Learning System Design.

EEEM071: Advanced Topics in Computer Vision and Deep Learning – Lab Spring 2023
 • Image representation, CNN Interpretability, Transformers, GANs, Domain adaptation and generalization.

EEE1032: Mathematis II - Engineering Mathematics Spring 2023
 • Signal Theory, Engineering Mechanics, Ordinary Differential Equations

ACHIEVEMENTS

- Predict-X, Mindspark-College of Engineering, Pune - Winner** Sep. 2017
- Category : *Time Series Prediction, Natural Language Processing (NLP)*
 - Involved two problem statements, Uni-variate Time Series prediction on stock prices and developing a rating system for products by sentiment analysis on Amazon product reviews.
- Smart India Hackathon 2018 - Finalist** Apr. 2018
- Category : *Recommendation system, Clustering, Churn Prediction*
 - Developed an Online Incubator platform for Skill Development and Entrepreneurship Ministry of India. Built recommendation systems based on location and job preferences for registered members.
- E-Yantra, IIT Bombay - Semi Finalist** 2017 - 2018
- Category : *Path planning, swarm robotics, Arduino programming*
 - Built a system of fully autonomous weeder bots using ATmega256 controller, in an attempt to implement the concepts of swarm robotics for farming.
- AWS Deep Learning Hackathon, IIT Madras - Placed 6th** Jan. 2018
- Category : *Deep Learning, Machine Learning, Feature Engineering*
 - Task 1: Developed a driver distraction detection system with Geo-tagging deployed using AWS lambda endpoints.
 - Task 2: Predict the maintenance date for Rolls Royce water pumps using past history and process logs.
- National Robotics Championship 2016, IIT Bombay - Zonal Winner** Mar. 2016
- Category : *Arduino programming, Micro controllers*
 - Developed Arduino based autonomous line follower bots.

PROJECTS

Web Template Image to code Generation | *Python, Flask, Keras*

- * Trained an End-to-End model to jointly learn the spatial characteristics from a snapshot (image) of a webpage and sequential information from its corresponding HTML code template.
- * Encoded vectors for image and text (code) are generated using two separate convolutional and RNN encoders respectively, and later fused using an attention mechanism

Face Sketch to Photo-realistic Images using GANs | *Python, Flask, Keras*

- * Trained a model based on Deep convolutional conditional Generative Adversarial Networks, to generate realistic images from hand-drawn face sketches.
- * Later extended to generate enhanced images from poorly lit images, or blurry images.
- * Incorporated separate gender prediction and age estimation models over the generated image, -particularly, important from the forensic identification perspective.

Driver Distraction Detection System | *Python, Tkinter, Keras*

- * Built a system to detect a distracted driver and alert him/her through a computer generated voice.
- * The system used a model trained using CNNs to classify the driver's actions into a set nine predefined distractions. The model took multiple frames from a streaming video feed captured from a dashboard camera.

LANGUAGES

English: Fluent (IELTS: Band-8)

Marathi: Fluent (Native)

Hindi: Fluent