

# Anway Pimpalkar

## Curriculum Vitae

Pune, India | [pimpalkaras19.extc@coep.ac.in](mailto:pimpalkaras19.extc@coep.ac.in) | +91 77739 91943 | [LinkedIn](#) | [GitHub](#)

### Education

College of Engineering Pune (COEP Technological University) – Pune, India

Expected Graduation May 2023

Bachelor of Technology in Electronics and Telecommunication Engineering

- **CGPA:** 8.16 / 10.00 (after 7<sup>th</sup> Semester)
- **Relevant Coursework:** Signals and Systems, Digital Signal Processing, Machine Learning, Deep Learning and Edge Intelligence, Data Analytics, Ordinary Differential Equations and Multivariate Calculus.

### Research Interests

Comprehending the neural basis of cognition, control, and neurological disorders; elucidating their mechanisms using machine learning techniques and signal processing.

### Publications

**Pimpalkar A\***, Patole R., Kamble K., Shindikar M. Performance Evaluation of Vanilla, Residual, and Dense 2D U-Net Architectures for Skull Stripping of Augmented 3D T1-weighted MRI Head Scans. Under review for the 2<sup>nd</sup> International Conference on Biomedical Engineering Science and Technology, India (2023). [[arXiv Preprint](#)]

### Fellowships and Awards

**Mitacs Globalink Graduate Fellowship**

[Details](#) | Dec 2022

Mitacs

Eligible to be awarded a fellowship of CAD 15,000 towards pursuing a Master's or Ph.D. program at a Canadian university.

**Best Project**

[Certificate](#) | Jun 2021

5<sup>th</sup> IEEE National Level Project Competition

Awarded out of a pool of 1000+ projects for 'Smart Elevator Systems using Embedded Machine Learning and Fire Safety Mechanisms'.

### Research Experience

**Research Intern**

Starting Jan 2023

Indian Institute of Technology (IIT) Bombay – Mumbai, India | Supervisor: [Prof. Nivethida Thirugnanasambandam](#)

Domains: Motor Cognition, Neural Signal Processing, Machine and Deep Learning

- Aiming to advance knowledge on the electrophysiological correlation of sense of agency and intentional binding using a machine learning approach.

**Undergraduate Researcher**

Aug 2022 to Present

COEP Technological University – Pune, India | Supervisors: [Prof. Ketaki Kamble](#), [Prof. Mahesh Shindikar](#), [Prof. Rashmika Patole](#)

Domains: Neuroimaging, Deep Learning, Neuropsychology

- Identifying the regional brain volume changes or neuroimaging biomarkers which can be seen in the structural MRIs of patients diagnosed with Major Depressive Disorder using a deep learning approach.
- Developed skull stripping pipelines robust to the multi-scanner variability issues using U-Net architectures and achieved a preliminary accuracy of 99.75% on test data.

**Mitacs Globalink Research Intern**

[Certificate](#) | May 2022 to Aug 2022

Dalhousie University – Nova Scotia, Canada | Supervisor: [Prof. Travis Esau](#)

Domains: Precision Agriculture, Point Cloud Processing, Image Processing and Segmentation, Electronic Control Systems

- Developed and evaluated automated mechanized systems to reduce the amount of human labor required for mechanical wild blueberry harvesting and field operations.
- Implemented real-time point cloud segmentation and volumetric analysis of the wild blueberries harvested in bins within a  $\pm 10\%$  accuracy range using industrial Time-of-Flight and RGB imaging tools.
- Designed a control system to automate the harvester head height using prescription maps of wild blueberry fields collected using multi-spectral drone data.

## Research Intern

Jun 2021 to Sept 2021

College of Engineering Pune – Pune, India | Supervisor: Mr. Swapnil Bukshete

Domains: Rehabilitation Science, Control Systems, Digital Electronics, Computer Vision

- Developed novel control system prototypes for a hand rehabilitation device to help patients with acute burn injuries to their MCP, DIP, and PIP joints.
- Generated computerized models of finger movement paths in flexion-extension cycles and a GUI-based feedback system to calibrate and control a lead-screw actuation mechanism based on STM32.

## Academic Projects

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### Thermal Imagery based Security System using Deep Learning

[GitHub](#) | Jan 2022 to May 2022

College of Engineering Pune – India | Supervisor: [Prof. Shrinivas Mahajan](#)

Domains: Computer Vision, Microcontroller Programming, Web Development, IoT

- Built a thermal imaging dataset for person detection and tracking to develop a security system.
- Evaluated the performance of multiple CNNs and optimized them for accuracy metrics and latency at the edge, and enabled remote access to the inferences and status of the system through a Platform as a Service model.

### Smart Elevator System using Embedded Machine Learning

[GitHub](#) | Apr 2021 to May 2021

College of Engineering Pune – Pune, India | Supervisor: [Prof. Deeplaxmi Niture](#)

Domains: Deep Learning, Microcontrollers, TinyML, Signal Processing, IoT

- Constructed a novel multi-tenant TinyML based device capable of detecting a person standing in front of an elevator and identifying a number spoken, indicating the floor number the user would like to reach.
- Integrated fire safety sensors into the system and built a deployable PCB unit.

### CovPrev - COVID-19 Symptom Checking and Sanitization Unit with App

[GitHub](#) | Feb 2021 to Mar 2021

College of Engineering Pune – Pune, India | Supervisor: [Prof. Neelima Kolhare](#)

Domains: Microcontrollers, IoT, Web Development

- Designed a pandemic-relevant system using physiological sensors and assemblies to provide selective entry to venues based on a patient's health conditions.
- Designed a mobile application to accompany the device, providing access to real-time graphical visualizations.

## Technical Skills and Test Scores

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**Fields:** Deep Learning, 3D Imaging, Microcontrollers, TinyML, Signal Processing, Data Science, Internet of Things

**Programming Languages:** Python 3, Lua, C++, C, R, JavaScript

**Tools and Libraries:** TensorFlow, Keras, MATLAB, FSL, ANTs, NVIDIA Jetson, Proteus Design Suite, KiCAD

**GRE:** 320 (Quantitative Reasoning: 166, Verbal Reasoning 154, Analytical Writing: Score Pending) | **IELTS:** 8.5 Overall Band

## Self-Learning Initiatives

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**Introduction to Neurohacking in R** | Johns Hopkins University on Coursera | [Record](#)

Sept 2022

**Fundamental Neuroscience for Neuroimaging** | Johns Hopkins University on Coursera | [Record](#)

Sept 2022

**Deep Learning Specialization** | DeepLearning.AI on Coursera | [Record](#)

Mar 2022

**Tiny Machine Learning (TinyML) Specialization** | HarvardX on edX | [Record](#)

Apr 2021

## Extra-Curricular Activities

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### COEP Rowing Team

Jan 2020 to Present

1X and 2X Sculler (Jan 2020 to Present), Rowing Representative (Aug 2020 to July 2021)

- Won multiple race events and awards commending enthusiasm and skill. Represented Pune City at inter-zonal races.

### COEP's Data Science and Artificial Intelligence Club

Sept 2020 to Present

Research Lead (July 2021 to June 2022), Student Member (Sept 2020 to Present)

- Led the research activities of the club consisting of 49 members, focused on a project to track vehicle plates on campus.

### COEP Impressions (College Annual Cultural Festival)

Aug 2019 to Jun 2022

Head of Events and Proshows (Jun 2021 to Jul 2022), Events and Proshows Team Member (Aug 2019 to Jun 2022)

- Responsible for planning and executing workshops, concerts, inter-college competitions, primary contact with celebrities.
- Worked at the team's helm, leading 15 members in the 6<sup>th</sup> edition of the festival.

