Atharva Chandak

Final year Computer Science undergrad at BITS Pilani

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Education

Birla Institute of Technology and Science, Pilani (BITS Pilani)
Pilani, India

Bachelor of Engineering in Computer Science (Minor in Data Science) — *AUG 2019 - JUN 2023*

Work Experience

Mila / Robotics and Embodied AI Lab, University of Montreal
Montreal, Canada

Research Intern (Supervisor: Prof. Liam Paull) — *JAN 2023 - PRESENT*

- Working on autonomous driving focused Continual Few-Shot Object Detection systems for my undergraduate thesis.

Airlab, Carnegie Mellon University
Pittsburgh, USA (Remote)

Intern (Supervisor: Prof. Sebastian Scherer) — *AUG 2022 - DEC 2022*

- Worked on **long-range detection** and **tracking** of aerial vehicles to autonomously avoid collisions.
- **Analysed a new dataset** for allowing building better models **robust** to **out of distribution** climatic conditions.
- **Designed optimized models** for **real-time usage** on the drone capturing high resolution feed from multiple cameras.

Wells Fargo
Hyderabad, India (Remote)

Intern (Supervisor: Mr. Raju Rajam) — *MAY 2022 - JUL 2022*

- Conceptualized and created an **end-to-end AI enabled speech chatbot** for answering user home lending queries.
- Integrated **speech-to-text** and **text-to-speech** APIs for allowing speech interaction with the bot.
- Implemented **NLP pipeline** for **intent and entity extraction** and achieved an **F1 scores** of **93.4%** and **83.5%**.
- Authored the **action server to process the user request** demands and **response curation** for replying back to user.

Visual Computing Group, Harvard SEAS
Cambridge, USA (Remote)

Visiting Undergraduate Intern (Supervisor: Prof. Hanspeter Pfister) — *JAN 2022 - MAY 2022*

- Contributed to the **Pytorch Connectomics** package adding cellpose model for neuron instance segmentation.
- Explored **semi-supervised methods** to improve upon the performance of **3D segmentation**.
- Designed an end-to-end **pipeline using long range affinity learning and transformers** for improving model accuracy.

Artificial Intelligence And Robotics Laboratory, Indian Institute of Science
Bangalore, India (Remote)

Intern (Supervisor: Prof. Suresh Sundaram) — *JUN 2021 - DEC 2021*

- Worked on **Generalized Continual Zero Shot Learning** for various **Computer Vision tasks.**
- **Integrated incremental learning with the zero shot learning framework** for more realistic adoption of DL methods.
- Extended the work to **generalized, out of distribution tasks** enabling **task free learning**.

CSIR-CEERI
Chennai, India (Remote)

Summer Intern (Supervisor: Dr. Amalin Prince & Mr. J Suriya Prakash) — *MAY 2021 - AUG 2021*

- Worked on **texture classification** of images using both **traditional ML** and **deep learning** based methods.
- Used traditional computer vision **algorithms like FAST, ORB & BRISK** combined with ML classifiers like **SVMs, KNNs, etc.**
- Extended the project to also implement simple image segmentation networks for performing **texture segmentation**.
- Applied these to **distinguish different types of industrial leather** produced & detect any cracks/faults in them.

Publications

(SUBMITTED) IEEE Transactions on Neural Networks and Learning Systems (Feb 2023)

LIFT-Net: Dual Stream Fourier Attention For Light Invariant Action Recognition

Skills

Languages	**Advanced:** Python | **Intermediate:** C/C++, JavaScript
Deep Learning	**Advanced:** Pytorch | **Basic:** Tensorflow, Keras
Machine Learning	**Advanced:** scikit-learn, Numpy | **Intermediate:** OpenCV, Pandas, Matplotlib
Robotics	**Intermediate:** Robot Operating System(ROS)
Web dev	**Advanced:** Flask | **Intermediate:** Nodejs, Expressjs, React, HTML5, SASS
Others	Git, Linux, LaTeX

Selected Projects

Light Invariant Action Recognition (Submitted)

Pilani, India

SUPERVISOR: PROF. KAMLESH TIWARI — *MAY 2022 - DEC 2022*

- Built **light invariant action recognition systems** for applications in autonomous systems, surveillance, etc.
- Designed a **two-stream transformer architecture** which attends to **raw and GIC frames** to perform the recognition.
- **First work to target multiple data modalities** using a single architecture for both **visible RBG** as well as **infrared** videos.
- Achieved **state-of the-art on** four benchmark datasets - **ARID**, **HMDB51**, **UCF101**, and **InfAR**.

Advertisement Understanding

Pilani, India

SUPERVISOR: PROF. POONAM GOYAL — *JAN 2022 - DEC 2022*

- Created an automatic **multimodal advertisement understanding** methods to perform tasks such as Ad generation, etc.
- Leveraged **external knowledge** for allowing better learning by the models and utilize it for knowledge graph creation.
- Devised **multimodal transformer** based on **ad image**, **captions**, **topic model** and **external knowledge** to perform **VQA**.

Competitions

E-Yantra Robotics Competition

e-Yantra IIT Bombay

RANK: TOP 20 — *SEP 2020 - MAR 2021*

- Were in the **top 20 teams** among 472 teams in the Robotics innovation challenge organized by IIT Bombay.
- **Maximized the number of delivery and returns of the parcels** by the UAV withinin fixed time to maximize score.
- Involved **control systems, path planning, image processing for QR scanning and marker detection, and developing algorithms** for a Gazebo simulated UAV.

AI RoboSoccer

IEEE BITS Pilani Chapter

RANK: 3RD — *MAR 2021*

- **Trained an RL Agent** which maximized the performance score of the simulated soccer team.
- Objective **reward** was **based on the number of goals scored and the passing accuracy** of the simulated players
- Used the **PPO algorithm** from **stable-baselines library** implementation for training the RL agent.

Teaching Positions

Teaching Assistant

Pilani, India

NEURAL NETWORKS AND FUZZY LOGIC (BITS F312) — *AUG 2022 - DEC 2022*

- Designing and conducting **course assignments** on various types of machine learning and deep learning models.
- **Conducting workshops** for teaching elementary concepts for programming neural networks.

Extracurricular & Volunteering

BITS-ACM STUDENT CHAPTER **Organized a software development hackathon** (HackBITSPilani); Contributed and managed various open source projects by BITS-ACM.

SHARE BITS PILANI Solved various corporate level problems while also inculcating the "Do Well Do Good" ideology of ShARE; **Interned at** a startup (**Catalytic Corps**) to build a framework to identify and **solve problems in Indian MSME sector.**

NATIONAL SERVICE SCHEME(NSS) AT BITS PILANI Volunteered at **Computer Literacy Program** team of NSS BITS Pilani; Also helped organise various social impact events like **Blood Donation Camps, Youth conference, etc.** for the people of Pilani.