

Yash Khare

EDUCATION

- 2018-2022 **B.Tech. in Computer Science and Engineering**, *Amrita Vishwa Vidyapeetham*, Kerala, India.
Ongoing *CGPA: 9.32/10*
- 2018 **St. Joseph's Academy, Higher Secondary Education ISC**, Dehradun, India.
Percentage: 94.25%
- 2016 **St. Joseph's Academy, Higher Education ICSE**, Dehradun, India.
Percentage: 92.2%

WORK EXPERIENCE

- June 2021 - **University of California, Santa Cruz**, RESEARCH INTERN.
Present - Working on using reinforcement learning(RL) to analyze economic situations for apprenticeship learning.
- Leading a team of 4, creating a complex multi-agent environment from scratch and developing the RL algorithms.
- Setup and managed the Pacific Research Platform Kubernetes cluster granted for the project.
- April 2021 - **Indian Institute of Technology, Roorkee**, RESEARCH INTERN.
September 2021 - Worked on adversarial robustness, proposed novel techniques for defending models against adversarial weight attacks.
- Developed a new adversarial weight attack that can bring down the accuracy of state of the art models trained on ImageNet to 0.2% by changing values of less than 25 out of millions of trainable parameters in a model.
- Developed a targeted attack that brings down accuracy of models on one class while retaining accuracy on other classes.
- September 2020 - **Major League Hacking(MLH)**, MLH FELLOW.
December 2020 - Worked on 6 sprints - 1. Open Ended 2. Education 3. Game Dev 4. Data, AI and ML 5. Dev Tools 6. Social Good.
- Was one of around 170 students selected for batch 1 of the fellowship out of 20000 applicants.
- Worked on projects such as mobile apps for aiding visually handicapped people, a mentorship system, and much more with a variety of technologies such as Django, React, Flutter, Godot, etc.
- My projects were judged amongst the top 3 in four out of six sprints.
- May 2020 - **Google Summer of Code**, OPEN SOURCE CONTRIBUTOR.
September 2020 - Trained single shot detection models to detect and classify objects and building materials in household environments.
- Due to limited data available, performed several augmentation techniques to prevent overfitting and converted trained models(MobileNetV2 architecture) to tflite models with an object detection accuracy of 91.3%. Built an Android app to leverage Google MLKit for using tflite models and automatically fill Poverty Probability Index(PPI) surveys.
- Wrote the documentation for the entire project.
- May 2020 - **Instruments Research and Development Establishment(IRDE), DRDO**, RESEARCH INTERN.
July 2020 - Worked on a fever screening system which uses a RGB camera to capture video and an IR Camera to detect temperature.
Used deep learning to extract regions of interest from the RGB feed and match those with the IR feed.
- Developed and integrated the software and integrating it with the hardware.
- Developed machine learning algorithms to automatically adjust the parameters of the uncooled IR camera.
- Developed a GUI for the app. The application was successfully deployed and is used by IRDE.
- August 2019 - **GitHub Education**, GITHUB CAMPUS EXPERT.
Present - Mentored for hackathons both national and international, gave talks, volunteered for conferences such as MLH HackCon.
- Held several events in my college with support from GitHub such as Hackathons hosted by amFOSS, Hacktoberfest events(in 2019 and 2020), and amDeC - an open source contribution program.
- November 2019 - **Defence Research and Development Organization(DRDO)**, RESEARCH INTERN.
December 2019 - Worked on a project involving digital image processing, and computer vision techniques for automatic target detection using background differencing, frame differencing, and difference fusion. Developed an algorithm for automatic detection of moving ground targets, viz. vehicle, human, etc. in image sequences captured by an IR imaging system.
- Experimental results demonstrated that the proposed algorithm can detect intruding targets with a good accuracy.
- Did research on using recurrent neural networks and RL for better results in videos with dynamic backgrounds.
- July 2018 - **amFOSS**, MEMBER AND MENTOR.
Present - Mentor my juniors and get them exposed to new technologies and open source as well.
- Help manage the day to day club activities, along with leading our social media campaigns, organizing events, working on technical projects, helping manage the community overall.

- May 2019 - **FOSSASIA, SUMMER INTERN.**
- August 2019 - Overhauled cloud deployment of 2 applications, resulting in reduced run time performance by 30%.
- Developed the hardware simulation, Badge Magic Android, of a LED name badge, by passing the 2D array into a filter of animation specific algorithm; this enabled people without the hardware to experience the hardware beforehand.
 - Worked on the Phimp.me application which is photo editing tool and implemented new features, filters and effects.
 - For both of these apps, I automated PlayStore and F-droid deployment process and improved the build time by 5 minutes using Fastlane tool, bash scripting, and continuous integration.

PROJECTS

- PConv Image Inpainting** **Tech stack: Python, OpenCV, PyTorch, Jupyter Notebook.**
 This is an implementation of the research paper by NVIDIA, "Image Inpainting for Irregular Holes Using Partial Convolutions" with a slightly different masking technique. Besides the implementation, I also built a python desktop application that allows users to do image inpainting by directly drawing on an image, complete with the model, jupyter notebook for training, as well as a python package that can be directly imported into any project. [\[Project\]](#)
- Psychic-CCTV:** **Tech stack: Python, Jupyter Notebook, PyTorch, PyQt.**
 Psychic-CCTV is a video analysis tool capable of analysing CCTV footage, or any low quality video. The tool performs super-resolution to enhance the video quality, object detection to obtain all objects of interest and sound extraction to separate different sounds by their sources for better analysis. [\[Project\]](#)
- Helping Hands:** **Tech stack: Python, Jupyter Notebook, Flask, Flutter, Microsoft Cognitive APIs..**
 Helping Hands aims to bridge the gap between them and the visual world by leveraging the power of Deep Learning which can be made accessible even on low-ended devices with a lucid User-Interface that would exactly allow them to better understand the world around. This project also won the first prize in the first sprint of the MLH Fellowship. [\[Project\]](#)
- Ocellus:** **Tech stack: React, Typescript, python..**
 This project does OSINT data analysis: IP address scans, IP address heatmap, tracking IPs, tracking mac addresses of a system, phone number and email verification, and blacklist and domain analysis. Developed as a part of Hac'KP, an international hackathon organized by the Kerala Police Cyberdome where the project was judged as one of the top teams out of 200+ teams.
- Kiwix:** **Tech stack: Kotlin, Dagger, RxJava.**
 Kiwix is an offline reader for Web content with one of its main purposes being making Wikipedia available offline in internet scarce places. I am one of the top contributors to the project with 100+ contributions. [\[Project\]](#)

Achievements

Summer Schools and Courses

- July 2021 **Eastern European Machine Learning(EEML) Summer School.**
 Selected for a prestigious 10 day long summer school by the EEML Community and DeepMind. It covered the theoretical portions of deep learning, reinforcement learning, vision transformers along with hands-on workshop sessions.
- July 2019 **Undergraduate Summer School, Indian Institute of Science, Bengaluru.**
 This program is for introduction into the fields of research like machine learning, algorithms and databases. It is mainly meant for final and pre-final year students, but sophomores can also apply. Was selected for the program in my sophomore year, being the only sophomore accepted out of the 90 selected students all over India.

Hackathons and Conferences

- o Won **2nd prize in IBM-Cloud Category** in FOSSASIA UNESCO Hackathon held in Singapore in 2019.
- o Finished as a **runner up in the IEEE GovTechThon'20**, out of the 100+ teams selected for the hackathon.
- o Invited to FOSSASIA OpenTech Summit'20, Singapore, to talk on **The Optimal Pathway to Deep Learning**
- o FOSSASIA **OpenTech Night winner**: Got invited to **FOSSASIA Open Tech Summit 2019, Singapore.**

VOLUNTEERING

- o **Student Social Responsibility(SSR) 2021**: SSR is Amrita's community outreach program that exposes students to the realities of life. Took sessions and workshops on the importance of cybersecurity, and how people can protect themselves, with a focus on the elderly and young children, most gullible to such attacks
- o **Amrita inCTF 2019**: Amrita inCTF is India's biggest Capture the Flag contest held by team bi0s, India's top cyber security team, at my college. Was responsible for event management and organization.
- o **Student Coordinator, Amala Bharatham Campaign | MAM, Amritapuri**: ABC is aimed at cleaning India's public places, national highways and tourist places. Every year, it is held on the occasion of India's Independence Day. Volunteered as a student coordinator for the campaign in 2018 and 2019.

TECHNICAL SKILLS

Languages Python, Java, Kotlin, Dart, C, C++, Bash

Tools PyTorch, Tensorflow, RLLib, OpenCV, MLFlow, Docker, Kubernetes, Git