

Yash Khare

OBJECTIVE

To gain exposure, enhance my skills and always be ready to learn new things.

EDUCATION

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

EXPERIENCE

- June 2021 - **Research Intern at University of California, Santa Cruz.**
Present I am working under Professor David Lee on using AI, particularly reinforcement learning to analyze economic situations for an apprenticeship learning setting. My research involves understanding how to create an economic system that provides opportunities for learning and upskilling, and the tensions/paradoxes that arise in trying to achieve that goal while also trying to compete in the marketplace and increasing productivity. I am leading a team of 4 members for this project and am working on creating an environment from scratch and developing the RL algorithms.
- April 2021 - **Research Intern at Indian Institute of Technology, Roorkee.**
Present I worked under Professor Sparsh Mittal in the field of adversarial robustness where we proposed novel techniques for defending models against adversarial weight attacks. We also worked on a new adversarial weight attack: capable of bringing down the accuracy of state of the art models trained on imagenet to 0.2% by changing values of less than 25 weights out of millions of trainable parameters in a model. A paper on our proposed methods is also under the works.
- April 2021 - **Bachelor's Thesis Research at Amrita Institute of Medical Sciences(AIMS).**
Present I am working with Professor Gilad Gressel, and Dr. Priya Nair from AIMS on AI assisted endoscopic-ultrasound(EUS). I am working creating an end-to-end pipeline, from preparing a dataset, training models, to creating an end-user application. Models trained by me for station classification in EUS have achieved an accuracy of 98.5%. The project is currently under progress.
- September 2020 - **MLH(Major League Hacking) Fellow.**
I was one of around 170 students selected for my batch out of 20000 applicants for the fellowship. I worked on making new projects and experimenting with new technologies every week, like Django, React, Flutter, Godot, etc. by collaborating in small groups on a series of short hackathon sprints. Projects I worked on came among the top 3 in 4 of the sprints. My team also came second in the MLH Graduation CTF.
- May 2020 - **Google Summer of Code.**
September 2020 My proposal, "Computer Vision Based PPI Tool Version 2.0", under the Mifos Initiative was accepted for GSoC 2020. I was responsible for training models to accurately detect and classify objects in household environments and build an Android app to leverage MLKit for using tflite models and automatically fill PPI surveys. My work also involved collecting data of the needed objects, performing augmentation to increase the dataset size and training and converting models to tflite on the gathered data.
- May 2020 - **Intern at Instruments Research and Development Establishment(IRDE).**
July 2020 I worked on developing a fever screening system. The system uses a normal camera to capture video and an IR Camera to detect temperature. I worked on developing the software and integrating it with the hardware. My work involved detecting faces in the RGB video and scale these inputs to match the scale of the IR camera such that temperature of only the facial regions could be extracted for which I used deep learning. A few parameters also change as the temperature of the IR camera changes when it is in use. I developed machine learning algorithms to automatically adjust the parameters so as to give the correct output. I also developed a GUI for the app. The application was successfully deployed and used by the organization.
- August 2019 - **GitHub Campus Expert.**
Present As GitHub Campus Expert, I receive training and mentorship from GitHub employees and support to help in the growth the developer community on my campus
- November 2019 - **Intern at Defence Research and Development Organization(DRDO).**
December 2019 I worked on a project involving digital image processing, and computer vision techniques for automatic target detection using background differencing, frame differencing, and difference fusion. An algorithm was developed by me for automatic detection of moving ground targets, viz. vehicle, human, etc. in image sequences captured by an infrared (thermal) imaging system. Experimental results demonstrated that the proposed algorithm can detect intruding targets with a good accuracy

- May 2019 - **FOSSASIA Internship.**
- August 2019 I overhauled cloud deployment of 2 applications, resulting in reduced run time performance by 30%. I helped in developing 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. My work was also on the Phimp.me Android application which is photo editing tool using OpenCV. 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.
- July 2018 - **Member and mentor at amFOSS.**
- Present amFOSS is the Free and Open Source Software club of my college. I am an active member and also mentor my juniors and get them exposed to new technologies and open source as well. I help manage the day to day club activities, along with managing our social media campaigns, organizing events, working on technical projects, helping manage the community overall.

SUMMER SCHOOLS AND COURSES

- July 2021 **Eastern European Machine Learning(EEML) Summer School.**
This was a 10 day long summer school organized by the EEML Community and DeepMind. It covered the theoretical portions of topics such as deep learning, reinforcement learning, vision transformers along with hands-on workshop sessions.
- June 2021 **MalGa Unige Summer Schools.**
This was a series of 3 week long summer school hosted by MalGa at the University of Genoa. The summer schools covered the mathematical portions of topics such as regularization methods, computer vision, and deep learning in great depth.
- August 2020 **AI Singapore Summer School.**
I was selected for the AI Summer School 2020 hosted by AI Singapore. Over the course, I learned about Reinforcement Learning, Federation Learning, AI in education and healthcare and much more on how to pursue a research oriented career in this field.
- July 2019 **Undergraduate Summer School, Indian Institute of Science.**
This program is a course for introduction into the fields of research where students are most involved currently. It is mainly meant for final and pre-final year students, but sophomores can also apply. I was selected for the program in my sophomore year itself after clearing the application and interview phases being the only sophomore accepted out of the 90 selected students all over India.

ACHIEVEMENTS

- Finished as a **runner up in the IEEE GovTechThon'20**, out of the 100+ teams selected for the hackathon.
- Got selected for **HackMIT 2020**, which is the annual hackathon organized by Massachusetts Institute of Technology.
- Judged as one of the **top teams out of 200+ teams** in Hac'kp 2020(international hackathon by the Kerala Police Cyberdome)
- Invited to FOSSASIA OpenTech Summit 2020, Singapore, to give a talk on **The Optimal Pathway to Deep Learning**
- Top contributor to Kiwix Android, a Wikimedia offliner, with **100+** contributions made.
- Got selected for **Hack The North 2019**, held at the University of Waterloo, Canada(travel funding provided)
- Won **2nd prize in IBM-Cloud Category** in FOSSASIA UNESCO Hackathon held in Singapore.
- FOSSASIA **OpenTech Night winner**: Got invited to **FOSSASIA Open Tech Summit, Singapore** in March 2019.

PUBLICATIONS

- Infrared Image Enhancement using Convolution Matrices** presented in the **International Conference on Optics and Electro-Optics 2019(ICOL 2019)** held at **Instruments Research and Development Establishment**, a **DRDO** establishment. Link: https://doi.org/10.1007/978-981-15-9259-1_76

PROJECTS

- EUS ML **Tech stack: Python, OpenCV, PyTorch, MLFlow, Jupyter Notebook.**
- April 2021 - I am working with Amrita Institute of Medical Sciences, one of the top medical institutes in India on AI assisted endoscopic ultrasound.
Present Being able to use AI as a tool to help clinicians identify potentially cancerous masses will help gastroenterologists in this procedure, and help avoid human error in the process. This project is also a part of my currently under progress Bachelor's thesis.
- PConv Image **Tech stack: Python, OpenCV, PyTorch, Jupyter Notebook.**
Inpainting This is an implementation of the research paper by NVIDIA, "Image Inpainting for Irregular Holes Using Partial Convolutions".
November Besides the implementation, I also built a python desktop application that allows users to do image inpainting by directly drawing
2020 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. Link to project:
<https://gitlab.com/yashk2000/pconv-inpainting>
- Vision PPI **Tech stack: Python, Jupyter Notebook, Tensorflow, Kotlin, Java, MLKit, Retrofit, RXJava.**
- March 2020 - I worked on Vision PPI as a part of Google Summer of Code'20. I trained models for image labelling using Tensorflow and converted
December them into a TensorflowLite model to be deployed on an Android app. The Android app is built using Java and Kotlin to perform
2020 object detection and automatically fill PPI Surveys based on the objects detected in an image. Link to project:
<https://github.com/openMF/ppi-vision>
- Psychic- **Tech stack: Python, Jupyter Notebook, PyTorch, PyQt.**
- CCTV: August Psychic-CCTV is a video analysis tool capable of analysing CCTV footage, or any low quality video. The tool performs super-
2020 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. Link to project:
<https://github.com/Fireboltz/Psychic-CCTV>

Helping Hands September 2020	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. Link to project: https://github.com/HarshCasper/HelpingHand
Ocellus: July 2020 - August 2020	Tech stack: React, Typescript, python. This project does OSINT data analysis: IP address scans, IP address heatmapping, tracking IPs, tracking mac addresses of a system, phone number and email verification, and blacklist and domain analysis. This was developed as a part of Hac'KP, an international hackathon organized by the Kerala Police Cyberdome. The project was ranked under the top 20 out of 200+ participants.
Tweegenous March 2019	Tech stack: Python, Jupyter Notebook. This project is used to collect tweets from twitter in different languages using NLP. It was developed as a part of the FOSSASIA-UNESCO Hackathon, in Singapore, in which my team won the 2nd place in IBM-Cloud Category. The tool was designed for people who speak indigenous languages. It collects tweets related to natural disaster and translates them in the language desired by the user and alerts people instantly if there is a natural calamity or any disaster headed their way by translating tweets. It is a two way system, for both the authorities and people. Link to project: https://github.com/tweegenous
Phimpme November 2018 - January 2020	Tech stack: Java, XML, Android, OpenCV. Phimpme is an open source photo editing application designed for android phones. I am one of the top contributors in this project and have fixed several bugs and made several new features. I am also one of the maintainers of this project. Link to project: https://github.com/fossasia/phimpme-android

VOLUNTEERING

- **SSR(Student Social Responsibility) 2021:** SSR is Amrita's flagship community outreach program that exposes students to the realities of life. Took several sessions and workshops on the importance of cybersecurity, and how people can protect themselves, with a focus on the elderly and young children who are most gullible to such attacks
- **Google Code-In(GCI) 2019-20 Mentor:** GCI is a contest to introduce pre-university students (ages 13-17) to open source software development. I was invited by the Wikimedia Foundation and FOSSASIA as a mentor for the GCI 2019.
- **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. I was responsible for event management and organization for the event.
- **Hacktoberfest Meetup Amritapuri:** This was a 2 day workshop to introduce beginners to Open Source via means of Hacktoberfest(a program by Digital Ocean). I helped organize this event on 9-10 October, 2019 and took sessions for the attendees to get them started with Open Source Contributions.
- **Programming Essentials Workshop 2019:** This is a 6 week long workshop(starting in August) to introduce freshers to basics of programming in languages such as C and Python. Juniors are also exposed to the world of Open Source Software and are taught about Git and GitHub. I took sessions and mentored over 60 students during the workshop.
- **Student Coordinator, Amritavarsham | MAM, Amritapuri:** Amritavarsham is the birthday celebration of Mata Amritanandamayi Devi. I volunteered in 2018 for Venue Maintenance and in 2019 for Plate Washing Seva.
- **Student Coordinator, Amala Bharatham Campaign (ABC) | 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. I volunteered as a student coordinator for the campaign in 2018 and 2019.
- **CIR Road to Excellence 2019:** This workshop is help by the placement cell of my college, CIR. There were several tracks in this workshop, out of which I was responsible for organizing and taking sessions in the Android Development Track. I took a workshop for a batch of 60-70 students on developing Android apps using Java and Kotlin.

LANGUAGES

English	Full Professional Proficiency
Hindi	Native Tongue, Full Professional Proficiency

COMPUTER SKILLS

OS	Linux(Debian and Fedora), Windows
Languages	Python, Java, Kotlin, XML, C, C++, Bash
VCS	Git, Mercurial
Tools	PyTorch, Tensorflow, RLLib, OpenCV, MLFlow, Docker, Kubernetes, VC Code, PyCharm, Android Studio

INTERESTS

Research	Computer Vision, Deep Learning, Reinforcement Learning, Mathematical and Theoretical Concepts of Machine Learning
Hobbies	Reading, Travelling, Singing, Guitarist, Contributing to Open Source

PERSONAL DETAILS

DOB	12 November, 2000
Residence	Dehradun, Uttarakhand, India
Status	Student