

Chinmay Awale

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- Indian Institute of Technology, Bombay
- Bachelors of Technology in Computer Science

2016-2020
GPA : 8.05/10

Academic Achievements

- Secured **All India Rank 45** in IIT JEE-Advanced out of 150,000 candidates (2016)

Appointments

Research Assistant, IIT, Bombay

Nov 2021 - Jul 2022

P.I. : Dr. Virendra Singh

- **skills:** python, gitpython, wireshark, nmap, C++.
- Developed a python framework to create a custom network of dockers and maintain its state.
- Generated data using the framework and used it for machine learning using factor graphs.
- tool development experience using **python** and **C++**.

Research Fellow, VJTI, Bombay

Nov 2020 - Nov 2021

P.I. : Dr. Faruq Kazi

- **skills:** bash, metasploit, x86 assembly, malware analysis.
- Read **Practical Malware Analysis** and understood the nuances of dissecting malicious software.
- developed a worm for windows 7 by using a metasploit exploit and a custom payload, that infected a USB drive and copied itself to any connected media that appeared as a drive.
- Tried various virtualization technologies and tried to set up a dynamic malware analysis lab.

Projects

BiscuitOS

spring 2021

Developing a Multithreaded Kernel From Scratch

- Developed a multithreaded kernel from scratch, currently only handles read on a **FAT16** fs in **C**.

Scale invariant feature transform in Image Stitching

Summer 2017

Summer of Code, WnCC IIT Bombay

- Implemented **SIFT (Scale Invariant Feature Transform)** from scratch using **python** and **NumPy**, Used for detecting image correspondence by calculating SIFT feature vectors for images.
- Implemented **K-dimensional tree** to find **k-nearest neighbour** for each SIFT feature.
- Studied **RANSAC (RANDOM Sample Consensus)** algorithm to eliminate the occurrence of bad matches.
- Studied various **interpolation** methods to merge two images into a single Panoramic image

On demand network lab hosting on docker

Summer 2018

Under guidance of Prof. R. K. Shyamsundar

- Implemented basic skeleton of a system with an **observer** model that can be used to create defined networks of dockers inside virtual machines giving freedom to alter network parameters.

Course Projects

Case study of Spectre attacks

autumn 2018

Computer Architecture

- Read the original paper on **spectre** by Paul Kocher et al. and also understood the Proof of concept.
- Investigated mitigation techniques like **Retpoline**

Indoor Location Finder

autumn 2018

Databases and Information systems

- Developed an android application with Django back-end for lecture attendance and student presence tracking

- Used Wifi-fingerprint at a location characterised by signal strength and BSSID for location tracking
- Designed and Implemented a statistical algorithm for Wifi-fingerprint matching with existing database

Style Transfer Techniques applied to Image De-noising problem

Spring 2018

Medical image processing

- Used a method described in the literature leveraging learned **Dictionary transfer** for Image De-noising using **K-SVD** and **matching pursuit** alternately as proposed in a paper by Gang Chen et al.

Image Alignment through maximisation of Mutual Information

Autumn 2018

Digital Image Processing

- Project involves approximation of **Mutual Information** of the images using **Histograms**
- Suitable alignment obtained by applying a rigid transformation to one image and maximising mutual information
- Achieve correct alignment to images with same as well as different imaging modalities

Elliptic Curve Digital Signature Algorithm

Autumn 2018

Cryptography and Network Security

- Studied Elliptic Curve Cryptography, point operation on curve group and few vulnerabilities in ECDSA.
- Implemented Signing as well as Verification functionalities along with all basic point operations.

Railway Signal Controller

Spring 2018

Digital Logic Design

- Programmed an **FPGA** board to function as signal controller in **VHDL** and **FPGALink** library.
- Understood and Implemented Serial **UART** communication to synchronize the FPGA with other FPGA.

Candi.io, Browser based multiplayer game

Autumn 2017

Software System Laboratory

- In-browser multiplayer game running on a **Node.js** back-end as game server and content distributor.
- implemented Simple game chat and Mechanics on **Phasor.io** library, akin to popular .io games.

Rudimentary Ray-tracer

Spring 2017

Programming Paradigms Laboratory

- Developed a basic sequential **Raytracer** within the functional programming paradigm of Racket.
- Improved Speed of **mesh-ray** intersection calculation by **Moller-Trumbore algorithm**.
- Implemented **Gourand Shading** (Smooth Shading), **distributed lighting** and **diffuse shadows**.

Technical Skills

Programming	C, C++, Java, Bash, Python, SWI-Prolog, Racket, Arduino, x86/MIPS Assembly
Web Development	HTML, CSS, JavaScript, Node.js, Bootstrap, SQL, PHP
Others	MATLAB, Gnuplot, NumPy, Make, Git, \LaTeX , VHDL, docker, IDA, gdb, OllyDbg

Positions of responsibility

Volunteer | Cyber-security Club, CSEA, IIT Bombay

July 2017 - July 2020

- Assisted organization and designed posters for talks of the club aimed towards promoting importance and relevance of Cyber-security in today's world.
- Prepared challenges for **institute wide CTF** event which had overwhelmingly positive response.

Member | Web and Coding Club, IIT Bombay

July 2017 - July 2018

- Help in organizing sessions of the club to promote open source among students new to coding
- Contributed to the development and update of Club website and Social pages of the club.

Teaching Assistant | Linear Algebra

Summer 2018

- Served as a Teaching assistant under **prof. I. K. Rana** for introductory course in Linear Algebra.

Extracurriculars

- Finished 9th in Toulouse Hacking Conference CTF (**THC CTF 2021**) (Team : IITBreachers) (2021)
- Finished 28th in **YauzaCTF 2021** (Team : IITBreachers) (2021)
- Finished 39th in **Reply Cyber Security Challenge 2021** (Team : IITBreachers) (2021)
- Finished 52nd in **DownUnderCTF 2021** (Team : IITBreachers) (2021)
- Finished 69th in **RedPwnCTF 2021** (Team : IITBreachers) (2021)
- Earned **Blue Belt** on **pwn.college** which is based on **Arizona State University's** CSE466. (2021)
- Associated with **National Service Scheme**, IIT Bombay under **Green Campus** program (2016-17)