Shubhamkar Bajrang Ayare
Computer Science and Engineering
IIT Bombay

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UG Third Year
Male
DOB: 09/05/1999

Examination	University	Institute	Year	CPI/%
Graduation	IIT Bombay	IIT Bombay	2018	8.24
Intermediate / +2	MSBSHSE	Anglo Urdo Boy's High School	2017	89.85
Matriculation	MSBSHSE	Rosary High School	2015	94.20

My Github Profile - digikar99

PROJECTS

py4cl2 – improved a library enabling python libraries in common lisp — Summer 2019 - present

- Contributed to an **open source** project, and currently a maintainer of py4cl2
- Achieved a **100-times speed up** in large array transfers by **identifying the bottleneck** and using pickling
- Used **inspect** python module to make function signatures available in common lisp
- Used **multithreading** to enable simultaneous reading of python output and writing to common lisp output; used **semaphores** and **macros** to enable capturing python output programmatically when required by lisp programs
- Improved **documentation** so as to enable new users to quickly figure out if the library meets their use case
- Enabled loading the python part of py4cl2 to be used from a variable, to make it **embeddable into lisp image**

uniform-utilities – providing zero overhead abstraction over lisp accessors — Summer 2019

- Created a utility library to provide a **zero-run-time overhead** uniform interface to various **accessors** in common lisp using **compiler macros.** The same also kept compile time type checking intact.
- Used **reader-macros** and **named-readtables** to provide syntax for accessors
- Created a **test suite** using **prove**, ensuring code coverage of critical parts using **sb-cover**

KnowTNet – a website aimed for hosting the best useful links of the internet — December 2019

- Used hunchentoot, parenscript, clsql (ORM), cl-markup to implement the **full stack**
- Used **argon2** to hash passwords, and provided abilities for **persistent login**
- Also implemented the website in a **serverless** format (with reduced abilities) using **local storage** and **React**

Image conversion using conditional GANs — Autumn 2019

Prof. Ganesh Ramakrishnan (course project) — *Foundations of Artificial Intelligence and Machine Learning*

- Worked in a **team** to implement satellite to non-satellite image conversion using conditional GANs
- Compared and analyzed performance of different variants of the model using **Inception Score** as a metric

Contention Resolution and Switching — Spring 2019

Prof. Ashwin Gumaste (course project) — *Digital Logic Design*

- Implemented Contention Resolution and Switching module of a router in VHDL using Xilinx ISE.
- Created and implemented state diagrams for reading and writing data to FIFO based **Virtual Output Queues**, Separate Virtual Output Queues were used for each input port to avoid head of line blocking.
- Created and implemented state diagrams for **Arbiter** for scheduling, in accordance with a round robin algorithm, while awarding **higher priority for the express buffer ports** at the same time.

Secure Personal Cloud — Autumn 2018

Prof. Soumen Chakrabarti (course project) — *Software Systems Lab*

- Developed an encrypted cloud storage with client-only keys stayed to provide true data privacy.
- Used **Django** to create the server, bootstrap to create responsive **views**; and **models** to interact with database, and provided an API for uploading and deleting files, viewing various field values
- Used **node.js**, and **browserify** to implement decryption on the webclient using **CryptoJS** library.
- Used the bash tools – **curl, inotifywait** to create a linux-client, with **single-client livesync** capabilities

Android — Summer 2019

- Added a **tablet mode** to the android app **bVNC** (a VNC viewer application), using **onTouchEvent**, to provide simultaneous support for **single finger scroll**, **long tap and drag** to select and **long tap** to right click
- Added **unicode math symbols** and **del** key to the open source android app **Hacker's Keyboard**

3D Tic Tac Toe Spring 2018

Prof. Amitabha Sanyal (course project) *Abstractions and Paradigms of Programming*

- Used **object oriented programming** to **encapsulate** and **abstract the board,** allowing internal board representation changes without any external changes Also abstracted the size and the difficulty
- Used **higher ordered functions** to implement a function to determine whether the current state is a win.
- Implemented **minimax algorithm** as the AI agent in the game.
- Used **racket/gui library** to implement the game as 4 2d Boards and git for version control.

Machine Learning Summer 2019

- Implemented Word Embedding Model for predicting movie review sentiment
- Implemented a Sequence to Sequence Neural Machine Translator for english to hindi

Web Development 2019

- Optimized the **layout** of The Common Lisp Cookbook to ensure **useability** on small screens.
- Implemented a **simplified** version of **PoP3** email protocol in C++ using **socket** programming. Multiple client support was provided using the select system call.
- Used a **static website** generator to redesign **70+ web pages** for **alterschoolindia**

Miscellaneous 2017-19

- Added examples and documentation for the common lisp **iterate** library
- Implemented **Davis-Putnam-Logemann-Loveland** in racket to solve the boolean satisfiability problem
- Used **Deterministic Finite Automata** to construct a regular expression matcher
- Experimented with **multithreading** in Java to determine when multithreading is useful
- **reader** – lisp library for providing **reader macros** for lambdas, hash-tables, hash-sets, accessors and mapping

ACADEMIC ACHIEVEMENTS

- Selected for **Chennai Mathematical Institute**'s B. Sc. (Honours) Mathematics Course (2017)
- Secured AIR 700 amongst 2 lakh candidates in JEE (Advanced) (2017)
- Secured AIR 1120 amongst 1.2 million candidates in JEE (Mains) (2017)
- Amongst national **top 1%** in **National Standard Examination in Physics** (2017)
- Selected for the award of scholarship in **National Talent Search Examination** (2015)
- Selected for the award of scholarship in **Kishore Vaigyanik Protsahan Yojana** (2015)

KEY COURSES

- Foundations of Network Security and Cryptography*
- Design and Analysis of Algorithms
- Software Systems Lab
- Data Analysis and Interpretation
- Discrete Structures
- Computer Architecture
- Abstractions and Paradigms of Programming
- Computer Networks
- Artificial Intelligence and Machine Learning
- Operating Systems
- Calculus
- Data Structures and Algorithms
- Database and Information Systems**
- Digital Logic Design
- Computer Programming and Utilization
- Linear Algebra

** would be completed by the end of April 2020

EXTRACURRICULARS

- Discovered RAM Manager for Magisk to **fix aggressive app killing** on android
- Active Quora, and Reddit user; 167 reputation on Stackoverflow; 41 reputation on AskUbuntu
- Tinkered with **Custom ROMs** and **rooting**, to extend the useable life of my smartphone and tablet
- Created an **offline repository** to decrease package installation times **(linux)**, and **backups** using Timeshift
- Conducted some **informal myopia research**
- Made **JEE Advanced Unsolved papers** available online
- Made a list of **Learning Points** from the **anime** Digimon Adventures and Naruto
- Under National Social Service scheme: **taught underprivileged kids** at an NGO (LCCWA); **recorded hindi news audio books**, as part of Voice for Purpose
- Aim to work on Artificial General Intelligence in free time; spent some time in **First Language Acquisition**, and currently focusing on Machine Learning; love to study people