Akash Cherukuri

Computer Science & Engineering

Indian Institute of Technology Bombay

190050009

UG Second Year

Male

DOB: 16-11-2001

Examination	University	Institute	Year	CPI / %
Graduation	IIT Bombay	IIT Bombay	2021	9.51
Intermediate/+2	TSBIE	Sri Chaithanya Narayana Junior College	2019	97.70
Matriculation	TSBSE	Narayana Concept School	2017	10.00

Pursuing an **Honours** in **Computer Science and Engineering**

Pursuing a **Minor** in **Entrepreneurship** offered by E-Cell, IITB

KEY PROJECTS

Theory of Machine Learning *(Winter, 2020)*

Self Project

- Studied the thoery of machine learning from *Understanding Machine Learning: From Theory to Algorithms* by Shai Shalev-Shwartz and Shai Ben-David

- Covered the criteria for a hypothesis class to be **(Agnostic) PAC Learnable**, **Learning via Uniform Convergence** and explored the importance of **VC Dimensions** for measuring the complexity of a model.

L.A.M.A. AI using Reinforcement Learning *(Spring 2020)*

Guides: Anuj Shetty, Kumar Ayush | WnCC, IIT Bombay *Seasons of Code*

- Programmed **reinforcement learning** driven AI, which analyzes the game's current state and takes appropriate favorable logical decisions to maximize the probability of success

- Implemented the "**Q-Learning**" model for the AI in which the hyperparameters and epsilon decay has been tuned by basic intuition, using a **State-QValue** map for storing the Q-Values for each state possible

- Demonstrated the effectiveness of the AI by **training for 10^6 games** against a naïve bot, upon which it was tested over a large number of games to yield a **win rate of approximately 70%**

Red Plag: Plagiarism Checker *(Autumn 2020)*

Guide: Prof. Amitabha Sanyal | IIT Bombay *Course Project*

- Implemented a modified version of **latent semantic analysis** which calculates the cosine similarity between different vectors in the covariance matrix corresponding to the data

- Programmed further **pre-processing functionality** if the program is written in C++, Python or Java, for **ignoring language specific syntax** to focus on raw code and yield **highly reliable results**

- Built a website using **Angular10** and **Django** which allows registered users to upload, process, view and download the percentage similarities between pairs of files visualized using a heat map.

Report on Data Structures and Algorithms *(Spring 2020)*

Guide: Prasanna Telawane | MnP Club, IIT Bombay *Summer of Science*

- Examined the methods of obtaining and streamlining algorithm complexity by incorporating efficient usage of optimal data structures for the situation, by reducing the number of computations required

- Covered the basics of **graph theory** and the different algorithms for graph traversal, such as **Dijkstra's Algorithm**, the A*-Algorithm and the **Bi-Directional Dijkstra's Algorithm**

- Assessed importance of string algorithms and trie-matching, and their usage in the **Human Genome Project** and other similar applications

Tetris using PyGame and Algorithms *(Autumn 2020)*

Team Project | PyGame

- Programmed a complete game of Tetris in Python3, using the **PyGame** library

- Implemented the official random block generating function, using the **7-Bag Algorithm** to reduce "flooding" and "drought" of specific blocks

- Implemented a bot which analyzes the current situation of the game, calculates the **best possible move** at the current state, and makes the appropriate logical decision in order to maximize its score

Scholastic Achievements

- Secured **All India Rank 40** amongst 246,000 candidates, in **JEE-Advanced** conducted by IIT Roorkee, under the Joint Admission Board, Government of India *(2019)*
- Awarded **Gold Medal** and a **Certificate of Merit** by Homi Bhabha Centre for Science Education, for placing among the **Top 42** in **National Standard Examination in Chemistry** *(2019)*
- Secured **All India Rank 21** amongst 217,000 Participants in **Engineering Agricultural and Medical Common Entrance Test**, conducted by the Jawaharlal Nehru Technical University *(2019)*
- Received a **Certificate of Merit** for being in the **top 54**, by Homi Bhabha Centre for Science Education, on the basis of performance in **Indian National Chemistry Olympiad Examination** *(2019)*
- Secured **All India Rank 192** out of 935,000 Aspirants, in **JEE-Mains-2019** *(2019)*
- Amongst **the Top 300** students selected to **Indian National Chemistry Olympiad**, by Homi Bhabha Centre for Science Education, from National Standard Examination in Chemistry **Top 1%** *(2019)*
- **Provisionally Shortlisted** amongst 50,000 candidates by **Kishore Vaigyanik Protsahan Yojana** to attend **Vijyoshi Camp** held at the Indian Institute of Science, Bangalore *(2018)*
- Amongst **the Top 300** students selected to **Indian National Astronomy Olympiad**, by Homi Bhabha Centre for Science Education, from National Standard Examination in Astronomy **Top 1%** *(2019)*

Internships and Responsibilities

Teaching Assistant - Physics *(Ongoing)*

- Mentored a batch of **38 freshmen students** in **PH107 - Quantum Physics and its Applications** by taking tutorial sessions to clear doubts through interaction
- Involved in the evaluation of answer scripts of quizzes and mid-semester examination

Academic Content Creator - Paathshala *(Winter 2020)*

- Worked with Paathshala Education as an Academic Content Creator to curate high-quality academic content in video form for over seventy questions with detailed solutions in Physics across different chapters.

Courses Undertaken

Computer Sciences	Advanced Image Processing*, Data Structures and Algorithms, Design and Analysis of Algorithms*, Abstractions and Paradigms for Programming, Software Systems Lab, Discrete Structures, Digital Logic Design*
Math and Statistics	Data Analysis and Interpretation, Linear Algebra, Calculus
Miscellaneous	Introduction to Stochastic Control*, Quantum Physics and Application, Introduction to Entrepreneurship, Introduction to Electronics Circuits, Biology, Engineering Graphics and Drawing, Basics of Electricity and Magnetism

(* to be completed by March 2021)

Technical Skills

Software	MATLAB, Unity, Blender, Git, AutoCAD, SOLIDWORKS, LaTeX, Markdown, Android Studio, Doxygen
Web Development	HTML5, CSS, JavaScript, AngularJS, PHP, ReactJS, Django
Programming	C++, C, C#, BASH, Python, QBASIC, Java
Libraries and Modules	PyTesseract, SkLearn, PyGame, Kivy, SciPy, NumPy, Pandas

Extracurriculars

- Awarded with a **Special Mention for Exemplary Volunteering Work** by **NSS, IIT Bombay** *(2020)*
- Participated and completed **Hacktoberfest 2020** presented by **Digital Ocean** *(2020)*
- Attended the science camp hosted by **KVPY** and recommended for scholarship at IISc, Bangalore *(2018)*
- Received a **Microsoft Certified Professional Transcript** for proficiency in Microsoft Excel 2007e *(2014)*
- Participated in **Capture The Flag** tournaments hosted by **CyberSecurity Club, IIT Bombay** *(2020)*