Akash Cherukuri
Computer Science & Engineering
Indian Institute of Technology Bombay

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UG Second Year
Male
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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 a **Minor** in **Entrepreneurship** offered by E-Cell, IITB

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)*

Key Projects

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 *Ongoing Course Project*

- Used the **bag of words** strategy to extract a signature vector from each file to identify plagiarism
- Implemented a modified version of **latent semantic analysis** which calculates the cosine similarity between different vectors in the covariance matrix corresponding to the data
- Adding further functionality for reliable detection if the program is written in C++, Python or Bash, which also accepts a base code with a provided boilerplate

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

Independent Projects

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

Rehydration Assistant *(Summer 2020)*
Team Project | Kivy Framework

- Developed an application in Python3 using the **Kivy Framework** as a base
- Implemented functionality to remind the user to drink water at pre-determined intervals by playing a custom audio file, after analyzing the methods offered by the package
- Examined various modules present in Kivy to implement file management system and to make the application display basic statistical information upon user request

Independent Chip Model Calculator for Poker *(Summer 2020)*
Individual Project | Python3

- Investigated the importance and usage of **Independent Chip Modeling** to efficiently determine the equity share of the prize pool in a tournament, based on the stack sizes of the remaining opponents
- Programmed this mathematical model in Python3, which uses stack sizes and chip counts of all players to efficiently and accurately generate a **Player-Probability Matrix**, containing player finish probabilities

Courses Undertaken

Computer Sciences	Abstractions and Paradigms for Programming(Theory + Lab), Data Structures and Algorithms (Theory + Lab)*, Software Systems Lab*, Discrete Structures*, Computer Programming and Utilization
Math and Statistics	Data Analysis and Interpretation*, Linear Algebra, Calculus
Miscellaneous	Quantum Physics and Application, Introduction to Entrepreneurship*, Introduction to Electrical and Electronics Circuits*, Biology, Engineering Graphics and Drawing, Basics of Electricity and Magnetism

**to be completed by November 2020*

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)*
- 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)*
- Participated in a **basketball** tournament during CSE Sports Weekend, conducted by CSEA *(2019)*