AMOKH VARMA

4th year UG Student | Computing and Mathematics Department, IIT Delhi
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EDUCATION

Year	Degree/ Certificate	Institute	CPI/%
2018 - 2023	B.Tech & M.Tech in Maths and Computing	Indian Institute of Technology, Delhi	**9.17**/10
2106 - 2018	CBSE(XII), Secondary School	Vishwa Bharati Public School	**95.4**%
2016	CBSE(X), High School	Vishwa Bharati Public School	**10**/10

PROJECTS

- **Multi Agent Intelligent System Analysis**, *Prof. Marcolino, Lancaster University* (*Mar'20 - Present*)
  - Developed a novel framework 'Ad-Leap Mas' providing an easy to use interface for ad-hoc reasoning domains as well as implementations to ensure a consistent set of baselines using algorithms like monte carlo tree search (mcts), PO-monte carlo plannings, and Approximate Gradient Ascent.
  - Worked on developing **OEATA**, an on-line estimation algorithm for task based ad-hoc reasoning domains. Undergoing revision after submission to AAMAS'20 Journal.
- **Privacy in Kalman Filter**, *Prof. Arpan Chattopadhyayr, IIT Delhi* (*Sep'20-Ongoing*)
  - Proposed a novel setting of privacy and adversary attack on kalman consensus filter based sensor networks.
  - Designed and proved a consensus algorithm to successfully protect sensor information from an adversary.
- **Graph Based Attention in Reinforcement Learning**, *Prof. Sayan Ranu, IIT Delhi* (*Jan'21 - May'21*)
  - Developed a pipeline to maximise reward in a graph based domain, using graph attention and Deep Q-Networks.
  - Demonstrated a visualisation for importance of various states in a DQN, using the attention weights.
- **Playing Scotland Yard using Deep RL**, *Prof. Arpan Chattopadhyay, IIT Delhi* (*Sep'20 - Dec'20*)
  - Created a training mechanism for the players of the game Scotland Yard, using DQNs and actor critic algorithm.
  - Used mcts and adversarial training for improved learning of the players.
- **Impact of Label-Noise on Neural Retrieval Models**, *Prof. Srikanta Bedathur, IIT Delhi* (*Sep'20-Ongoing*)
  - Analysed the effect of label noise on ranking metrics (like NDCG) of ML based information retrieval models
  - Worked in collaboration with IBM to develop reinforcement learning based algorithms for data cleaning.
- **Computational Numerical Methods**, *Prof. Pratibha Shakya, IIT Delhi* (*Jan'20 - Apr'20*)
  - Implemented root finding techniques like **Newton-Raphson**, to find the zeroes of functions using MATLAB
  - Executed numerical methods to find the solutions to ODEs and approximate the integral of various functions
- **Implementation of standard machine learning algorithms**, *Prof. Prathosh, IIT Delhi* (*Jan'20 - Mar'20*)
  - Built generic **Neural Network, Linear Regression and SVM** models using only Numpy and CVXOPT
- **Data Structures and Algorithms Implementations**, *Prof. Subodh Kumar, IIT Delhi* (*Sept'19 - Dec'19*)
  - Created a student database management system using **linked lists**, **customized iterators** and improved it to include hash tables using **binary tree separate chaining** and open addressing using linear probing.
  - Developed a **thread safe** e-commerce platform to facilitate multi-party synchronous access.
  - Implemented an interactive job scheduler using **red black trees**, **tries** and **binary heaps** and a graph based greedy algorithms to perform various operations on triangles located in the 3-dimensional space.

TEACHING ASSISTANT

- **Advanced Probability, NPTEL** (*Ongoing*)
- **Stochastic Control and Reinforcement Learning, ELL729 IIT Delhi** (*Ongoing*)

INTERNSHIPS

- **IBM Research, Bangalore**, *Undergraduate Researcher* (*May'21 - July'21*)
  - Implemented policy gradient based RL to preform model agnostic sampling from an imbalanced dataset.
  - Created an easily extendable pipeline to clean data using Data Readiness Toolkit by IBM and the above sampling procedure.
- **PIXEL AI, Hyderabad**, *Computer Vision Engineer* (*May'20 - July'20*)

- Developed transfer learning models using **EfficientNet, ResNet, InceptionV3** etc to predict eye diseases
- Implemented **variational auto-encoders** to generate more data and serve as bottleneck for other models
- Designed segmentation network using **U-net** to extract cup and disk of retinal images to predict glaucoma
- Created web API endpoints for the ensemble of models and deployed them in the form of docker containers

COURSE-WORK

- **Undergraduate:** Stochastic control and Reinforcement Learning, Graph Neural Networks, Analysis and Design of Algorithms, Detection and Estimation, Numerical Computing, Machine Learning and Intelligence, Data Structures and Algorithms, Probability and Stochastic Processes, Functional Analysis, Linear Algebra, Calculus

SCHOLASTIC ACHIEVEMENTS

- **IIT Delhi semester merit award:** For meritorious academic performance (**top 7% (SG 9.88/10)**) in Spring'19.
- **Department Change :** From Electrical Engineering by virtue of excellent performance among 900+ students
- **All India Rank: 502** in Joint Entrance Examination (Advanced), 2018 among **0.23 million** candidates.
- **KVPY scholar** Selected as a KVPY scholar, a national fellowship for basic sciences, after a 2-tier selection process.
- **Merit Certificate:** For being among **top 1%** nationally in National Physics, Chemistry and Astronomy Olympiads.