

ADITYA RASTOGI

GitHub Profile
Personal Website CSE - IITKGP



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ACADEMIC DETAILS

Education	Institute	Year	CGPA / %
B. Tech and M. Tech (Dual Degree): Computer Science and Engineering	IIT Kharagpur	2016 - 2021 (Expected)	9.42 / 10

INTERNSHIPS

Pattern Matching in Trillion Edge Graphs

Mitacs Globalink Research Intern, University of British Columbia
(Advisor: Prof. Matei Ripeanu)

May'19-Jul'19

- Worked in a team to solve the problem of **approximate pattern matching in graphs** in a distributed systems setting.
- Compared our pattern matching algorithm with TriAD, a distributed RDF engine.

Research Areas: **Algorithms, Distributed Systems, Graph Theory**

Facial Landmarks Detection

Visiting Student Researcher, University of Sydney
(Advisor: Dr. Mehar Khatkar)

Dec'18-Jan'19

- Designed and compared different CNN architectures with target point coordinates for detecting facial landmarks in different fish species.

Research Areas: **Deep Learning, Landmark Detection, Data Augmentation**

Sensor Diagnostics

Summer Intern, IIT-Kharagpur - Sponsored by Shell India Pvt. Ltd.
(Advisor: Prof. Swanand Khare)

May'18-July'18

- Developed a **Python application** to **sample from an arbitrary finite-ranged probability density** in one dimension.
- Reduced dimensionality of multiple sensors time-series data using **PCA** and **autoencoders**.
- Worked on **gaussian-mixture models** and error distributions in general.

Research Areas: **Machine Learning, Dimensionality Reduction, Predictive Analysis**

PROJECTS

Smart Rockets, Algorithmic Visualisations and Web-game Development

p5-js, HTML, CSS

- Developed Smart Rockets, a demo of a **genetic algorithm**. Developed algorithmic visualisations on the web for algorithms like **Convex Hull**, Voronoi Diagram, Longest Increasing Subsequence etc.
- Used p5.js for creating **fractal** designs like trees, koch curves and flow field visualisation of **perlin noise**.
- Developed casual, fast-paced and puzzle 2D web-games.

Visualising Deep Neural Network Architectures - B.Tech Project

p5-js, TensorFlow.js
(Advisors: Prof. Partha Pratim Chakrabarti and Prof. Aritra Hazra)

Aug'19 - Present

- Developing a visualisation software for deep neural network architectures.
- Developing collaboratorial and adversarial agents to conduct unsupervised and statistical analysis on top of the neural network architecture.

BLOG POSTS

- Elucidating **Policy Iteration in Reinforcement Learning** — Jack's Car Rental Problem : *Towards Data Science*

CERTIFICATIONS

- **Neural Networks and Deep Learning** : *Deeplearning.ai - Coursera*
- **Improving Deep Neural Networks: Hyperparameter tuning, Regularization and Optimization** : *Deeplearning.ai - Coursera*
- **Structuring Machine Learning Projects** : *Deeplearning.ai - Coursera*
- **Mathematics for Machine Learning: PCA** : *Imperial College London - Coursera*

TERM PROJECTS

- Built a deep neural network in python from scratch to classify messages as spam or ham.
- Implemented a memory-resident file system in Operating Systems Lab. Simulated Virtual Memory using Demand Paging, compared CPU scheduling algorithms and implemented a command-line interpreter running on Linux.
- Developed an API to do reliable communication over an unreliable link using timeouts and acknowledgements. Implemented a simplified FTP version in C.
- Implemented a single-cycle processor (RISC architecture) in Verilog.
- Designed a compiler for tiny-C.
- Developed a Java-based software to manage a personal library system.
- Implemented cryptographic algorithms like AES and DES in C from scratch and ran them on images and text.

SKILLS AND EXPERTISE

- **Languages** : Python, C, C++, Java, HTML, CSS
- **Libraries and Tools** : TensorFlow.js, Keras, p5.js, Processing, Numpy, Scipy, Matplotlib

COURSEWORK INFORMATION

- **Completed** : *Programming and Data Structures | *Algorithms - I | Discrete Structures | *Signals and Networks | Machine Learning | Formal Language and Automata Theory | *Switching Circuits and Logic Design | *Software Engineering | Probability and Statistics | *Computer Organization and Architecture | *Compilers | Algorithms - II | Data Analytics | Cryptography and Network Security | *Operating Systems | *Computer Networks | Computational Complexity | Combinatorics and Computing | Quantum Computing - Project Seminar
- **Will be completed by May 2020** : Theory of Computation | Object-Oriented Systems | Artificial Intelligence | Reinforcement Learning | Image Processing | High Performance in Computer Architecture | Linear Algebra
- **Micro Credit Course** : Computational Intelligence in Cyber Security
* marked courses have a laboratory component as well.

POSITIONS OF RESPONSIBILITY

- **Student Mentor** *July'18-Present*
Mentored 1st-year students under the Student Mentor Programme conducted by Student Welfare Group.

AWARDS AND ACHIEVEMENTS

- Cleared regionals and participated in the nationals of Indian National Astronomy Olympiad conducted by HBCSE.
- Secured state rank 2 in International Olympiad of English Language' 15 conducted by SilverZone.
- Recipient of the Goralal Syngal Memorial Scholarship.
- Div. 1 rated Codechef user.