Aditya Rastogi

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ACADEMIC DETAILS

Education	Institute / Board	Year	CGPA / %
B. Tech and M. Tech (Dual Degree): Computer Science and Engineering	IIT Kharagpur	2016 - 2021 (Expected)	**9.63 / 10**
Class - XII	CBSE	2016	**96.2 %**
Class - X	CBSE	2014	**10 / 10**

RESEARCH EXPERIENCE

Sensor Diagnostics

Summer Intern, Shell India Private Ltd. and IIT-Kharagpur *May'18-July'18*
(Advisor: Prof. Swanand Khare)

- Reduced dimensionality of multiple sensors' time-series data using **PCA** and **autoencoders**.
- Worked on the pre-image problem in **kernel-PCA** and change-point detection methods.
- Studied Baeysian statistics and Monte-carlo-markov-chain sampling methods.
- Worked on gaussian-mixture models, **EM-algorithm** and error distributions in general.

Research Areas: **Machine Learning**, **Dimensionality Reduction**, **Pre-Image Problem**, **Predictive Analysis**

KEY PROJECTS

Interactive Algorithmic Visualisations and Web-game Development

p5-js, HTML, CSS *May'18-Sept'18*

- Developed algorithmic visualisations on the web for algorithms in **Graph Theory**, Voronoi diagram, Convex Hull, Maximum 2D Range Sum, LIS, fractals etc. using p5-js.
- Worked with **Physics Engines** like Box2D, Matter.js etc. and **genetic algorithms**.
- Developed 2D-rendered games using **p5-js** as well.

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Artificial Intelligence game development

Chain Reaction: AI Game Development *Aug'18-Present*

- Developing an unbeatable single player web version of the popular android game Chain Reaction.
- Used javascript and **WEBGL** to render interactive 3D graphics in the web browser.
- Using **reinforcement learning** techniques to build the AI version.

https://github.com/thunderInfy/Chain-Reaction-AI

Spam classifier

(Advisor: Prof. Saptarshi Ghosh) *Mar'18-Apr'18*

- Built a **deep neural network** in python from scratch to classify messages as spam or not-spam.
- Applied porter-stemming, used sigmoid and hyperbolic tangent as the activation functions.
- Used softmax function for probabilistic outputs.

https://github.com/thunderInfy/Spam-Classifier

Sampling from Arbitrary Finite-ranged Probability Density in one dimension

(Advisor: Prof. Swanand Khare) *Jun'18*

- Developed an interactive python drawing app using open-source Kivy library.
- Interpreted the output image as a finite-ranged probability density in one dimension using Image Processing.
- Sampling was done from the density function using **rejection sampling methods**.

https://github.com/thunderInfy/Statistical

Microsoft Code.Fun.Do
Servizio: Android App Development *Mar'18*

- Developed an android app which integrated the customer base with the service-providers.
- The app would provide short term employment to people and would help people in availing small services.
- Used Google firebase database cloud services for providing notifications on the app.

https://github.com/thunderInfy/Code-Fun-Do-Servizio

Personal Library System Software
(Advisor: Prof. Sudip Misra) *Jan'18-Apr'18*

- Developed a **Java** based software on personal library system.
- Used software engineering techniques and tools like SRS documents, **UML** class diagrams, use-case diagrams, sequence diagrams, state-chart diagrams, Java swing, JUnit testing etc.

https://github.com/thunderInfy/Personal-Library-System-software

Compiler for tiny-C
(Advisor: Prof. Pralay Mitra) *July'18-Nov'18*

- Developed a compiler for tiny-C, built front-end of the compiler using **flex** for lexer and **yacc** for parser.

https://github.com/thunderInfy/compiler-for-tiny-C

TECHNICAL SKILLS

- **Languages :** Python, C, C++, Javascript, R, Java, Verilog, MySQL, HTML, CSS, LaTeX, MIPS Assembly
- **Libraries and Tools :** tensorFlow, Numpy, Scipy, Matplotlib, OpenCV, Processing, p5js, Hadoop

RELEVANT COURSES

- **Completed :** *Programming and Data Structures, *Algorithms - I, Discrete Structures, Machine Learning, Formal Language and Automata Theory, *Switching Circuits and Logic Design, *Software Engineering, Probability and Statistics
- **Ongoing :** *Computer Organization and Architecture, *Compilers, Algorithms - II, Data Analytics, Cryptography and Network Security
- **Online courses :**
  - **Neural Networks and Deep Learning** by deeplearning.ai on coursera.
  - **Mathematics for Machine Learning: Principal Component Analysis** by Imperial College London on coursera.

  * marked courses have a laboratory component as well.

POSITIONS OF RESPONSIBILITY

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

AWARDS AND ACHIEVEMENTS

- Institute topper after the first semester at IIT Kharagpur out of a total of 1324 students.
- 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.
- Zone Topper in Indian Intelligence Test 2015 conducted by Jagran Group.
- Recipient of the Goralal Syngal Memorial Scholarship.
- Voluntarily participated and actively contributed in the data collection process associated with "Assessment of Program Comprehension Skills using Eye Gaze Tracker".
- Selected as a visiting student researcher at the University of Sydney from Dec'18 to Jan'19 in the field of Deep Learning in Computational Genomics and Phenomics.