

# Nandini Agrawal

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## EDUCATION

**Ashoka University** | Sonapat, Haryana

August 2020 - May 2021

Candidate for Postgraduate Diploma in Advanced *Studies and Research*

*Major:* Computer Science

*GPA:* 3.96/4.00

*Honors/Awards:* **Dean's List**

*Relevant Coursework :* Calculus, Unstructured Information Processing, Capstone and Thesis Project: Privacy Preserving Machine learning,, Synthetic Data Generation, Web Data Modelling, Data Mining and Warehousing

**Ashoka University** | Sonapat, Haryana

August 2017 - May 2020

*Bachelor of Science(Hons)*

*Major:* Computer Science

*Major GPA:* 3.9/4.00 (16 courses) | *Cumulative GPA:* 3.82/4.00

*Honors/Awards:* **Magna Cum Laude; Silver Medal for Academic Achievement; Dean's List** (5 semesters)

*Relevant Coursework :* Machine Learning, Linear Algebra, Discrete Mathematics, Probability and Statistics, Blockchain and Cryptocurrencies, Computer Security and Privacy, Federated Learning, Algorithms design and analysis, Computer Programming, Computer Networks

**Mayo College Girls' School** | Ajmer, Rajasthan

April 2017

*Honors/Awards:* School colours for excellence in Computer Science and Squash, Computer Science President, Squash Captain, Scholarship for securing 95% and 94% in 12th and 10th grade respectively.

## PROFESSIONAL EXPERIENCE

**Ashoka University, Teaching Assistant** | Sonapat, Haryana

August 2019- May 2021

- Appointed as a teaching assistant for four courses : Computer Organisation and Systems, Introduction to Computer Programming, Computer networks and Blockchain & Cryptocurrencies in 4 different college semesters.
- Mentored a core of 40+ students, delivered lectures, graded assignments and provided feedback to students.

**Koc University, International Summer Research Intern** | (Online)

July 2020- September 2020

- Implemented **Blocksim-Net**, a simple, efficient, high performance, network-based blockchain simulator.
- Collaborated with a team of 4 to build this simulator which simulates bitcoin and ethereum networks along with selfish mining attacks on these networks.
- The paper was accepted and [presented](#) at the [Basarim'20](#) conference.

**Ashoka University, Research and Software Development Intern** | (Online)

June 2020- August 2020

- Developed **Covidbloc**, a system involving an android mobile application and a web portal that uses blockchain powered contact tracing to track and prevent the spread of COVID-19.
- Our team(of 3) submitted the proposal to the [Space'20](#) conference.

**Kings College London and Trivedi Centre for Political Data, Intern** | (Online)

May 2020- August 2020

- Created an **automated scraping system** to extract useful documents released by the Indian government to tackle the Covid-19 pandemic.
- Implemented a **document classifier** to classify these documents sector wise/topic wise.
- Extracted important information by analysing these policies and displayed this information [graphically](#).

**Metlife, Data Analysis Intern** | Noida, Uttar Pradesh

June 2019- July 2019

- Implemented a regression model to forecast sales of the company.
- Extracted important information by analysing these sales and wrote a report.

## PROJECTS

**Secure ML, Privacy Preserving Machine Learning** | Python, Socket Programming, Machine learning library - Pysyft

- Implementing a linear regression [model](#) in a secure 2 party environment as per the protocols mentioned in the [Secure ML](#) paper. The presentation of that implementation can be found [here](#).
- Implemented a basic [Federated learning](#) model(from scratch) on the MNIST fashion data set.

### **Synthetic Data Generation**, *Machine Learning* | Python, Selenium, Machine Learning libraries - Tensorflow, Keras

- Using Conditional Generative Adversarial networks and Monte Carlo Markov Chain using Gibbs Sampler to generate synthetic data to model sexual harassment cases in India.

### **Data Decision Support**, *Data Mining and Warehousing* | Python, Selenium, NLP libraries, Mapbox, Javascript

- Scraped data about top hotels using selenium from Booking.com
- Cleaned data and performed analytics on that data such as polarity score calculation, clustering of hotels, etc.
- [Visualised](#) top 10 hotels based on average polarity score using map box.

### **Hyperfunds**, *Blockchain Development* | Hyperledger Fabric, Python, NodeJS, REST, Docker, Amazon Web Services

- Developed a simple distributed Hyperledger [application](#) that can help faculty at Ashoka University reliably spend their research funds with approval from the right administrators.

### **Conversational Chatbot and Image Coloriser**, *Machine Learning* | Python, Machine learning libraries - Keras, Tensorflow

- Implemented a conversational [chatbot](#) using the Cornell movie dataset and a seq2seq model with attention.
- [Image Coloriser](#) dealt with converting black and white images to coloured images using a convolutional neural network model and a subset of the LFW dataset.

### **Automatic Essay Grader**, *Machine Learning and NLP* | Python, Nltk, Machine learning libraries - Keras, Tensorflow

- Created a Bidirectional LSTM based machine learning [model](#) (with embeddings) for grading essays using the Hewlett Foundation dataset.
- Can be used to aid teachers with grading essays on standardized tests.

## **PUBLICATIONS**

- N. Agrawal, P. Ramachandran, O. Biçer, A. Küpçü. 2020. [Blocksim-Net](#): A Network-Based Blockchain Simulator

## **OTHER ACCOMPLISHMENTS**

- **Triquetra Squash Championship, IIITD, DTU** : Secured the **first** position in the inter-college women's individual squash championship.
- **Explore ML, Explore ML with Crowdsource and Big Data** : Completed the certified **Big Data** course by **Jennifer Widom** and **Explore ML & Explore ML with Crowdsource** course by **Google**.
- **Member of the Women in Computing Society**: As a member of WICS, we create a collaborative and friendly environment for the women pursuing computer science at Ashoka University.
- **National Level Squash Player** : Was a part of the top 16 players in the nationals under-19 women's category. Ranked **3rd** in State championship in women's U-19.