Richa **Sharma**

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EDUCATION

Aug 2019 - Jul 2021 **Emory University**, *Masters in Physics*
Relevant Courses: Machine Learning, Quantum Computation, Quantum Physics, Mathematical Physics, Electrodynamics, Statistical Physics, Classical Mechanics

Aug 2013 - Jun 2017 **Netaji Subhas Institute of Technology,** *Bachelors in Engineering, Electronics and Communications*
Relevant Courses: Algorithms, Data Structures, Programming Fundamentals I and II, Software Engineering, Computer System Architecture, Digital Signal Processing.

PROFESSIONAL EXPERIENCE

Aug 2019 - Jul 2021 **Research Assistant**
Department of Physics, Emory University
- Worked under Prof. Boettcher, on Quantum Walks and Computational Physics. Increased the efficiency of the Quantum System simulations to evolve 10^6 times.
- Simulated several Quantum Walk systems with high memory requirements for defects and other phase disorders data in the Hierarchical Models. Utilized Numpy Arrays to decrease Time and space Complexity for Matrix Multiplications.
- Worked on Mathematical Physics Projects involving Novel PT Symmetric potential and simulated bounded particles in them.

May 2018 - Mar 2019 **Research Assistant**
Society for Applied Microwave Electronics Engineering & Research (SAMEER)
- Worked on Linear Accelerators and Simulated Transfer Matrix for 6 MeV Linac, assembly of LINAC, resonant cavities, and improved its design for better Q-Factor of LINAC.
- Worked on the initial stage of a project to improve cancer therapy systems available in India. Worked on the implementation of the design of a large scale Synchrotron cancer therapy facility.

May 2016 - Aug 2016 **Research Assistant Intern**
Bhabha Atomic Research Centre (BARC)
- Developed a Brain-Computer interface for KUKA robotic arm and EEG controller. Designed and implemented the experiment to capture hand-motion and EEG signals successfully.
- Built a binary classifier to distinguish the data of the left and right brain signals. Successfully trained the Neural Networks for Binary Classifier using Matlab's deep learning toolkit and increased the **accuracy of the model from 70% to 96.3%.**

ACADEMIC PROJECTS

Sep 2020 - Nov 2020 **Loan Default Detection through Customer Segmentation**
- Customer Segmentation is studied using feedback from supervised learning and running unsupervised learning algorithms such as K-means and K-mode clustering.
- Calculated feature importance using Elastnet by monitoring which coefficients become non-zero first. Ran Logistic Regression and CART Classifiers with 99% accuracy.

Simulation of Spatially Variant Quantum Walks
- Converted older C++ code to Python Script without losing effieciency of the C++ and evolved Quantum Systems to 10^6 time-steps. Simulated different statistical measures to analyze the nature of walks. Instead of applying complicated matrix multiplication I've smartly reduced memory constraints using Numpy arrays and its functions.

Aug 2016 - Oct 2016 **Hadoop and Mapreduce on Discussion Forums**
- Ran Mapreduce jobs on a Virtual Machine, to determine the correlation between the length of posts and answers.

SKILLS

Research: LaTeX, Team Communication, Poster Design, Technical Writing.

Technical: Python, Jupyter Notebooks, C++, HTML and CSS, Mathematica, Matlab, PyTorch, Mapreduce in Hadoop, SQL, Qiskit

Specific Topics and Algorithms: Machine Learning-Supervised and Unsupervised Learning, Quantum Computing Algorithms, Random Walks

SOFTWARE

Anaconda, Spyder, Jupyter Notebooks, PostgreSQL, Windows, Sublime Text Editor, MS Office, Slack