Ayush Chetan Ghatalia

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Education

Birla Institute of Technology and Science, Pilani **Oct 2021 – Present**

Bachelor of Engineering (Hons.) in Computer Science Engineering, Minor in Finance *Goa, IN*

CGPA - 9.23/10, Minor GPA - 10/10 - Recipient of Institute Merit Scholarship (Top 3%)

Publications

1. *"Comparing the role of Spatially and Temporally capable Deep Learning models in Rainfall Estimation: A Case Study over North East India."*
   Shanay Mehta*, **Ayush Ghatalia***, Aditya Kulkarni*, Ritu Anilkumar*.
   Accepted at European Geosciences Union (EGU) 2024

2. *"A comparison of spatially and temporally informative deep learning models in the estimation of rainfall over undulating terrain."*
   A Kulkarni*, **A Ghatalia***, et.al.
   Submitted at International Geoscience and Remote Sensing Symposium (IGARSS) 2024
   * *Indicates equal contribution*

Experience

Department of CSIS - BITS Pilani **Aug 2023 – Present**

First Degree Teaching Assistant *Goa, IN*

- **CSF222** - Discrete Structures in Computer Science - Conducted weekly tutorials and quizzes for 230+ students.
- **CSF241** - Microprocessors and Interfacing - Designed, invigilated and evaluated weekly labs for 260+ students.
- **CSF212** - Database Systems - Designed, invigilated and evaluated weekly labs for 260+ students.

North Eastern Space Applications Centre, India **May 2023 – July 2023**

Machine Learning Research Intern — Supervisor : Mrs. Ritu Anilkumar *Meghalaya, IN*

- Part of a 7-member team. Developed and tested an ML algorithm to predict rainfall in north eastern states of India.
- Integrated Pytorch with the python API of Google Earth Engine cloud computing platform for data extraction/analytics.
- Implemented a UNET and an LSTM model tailored for rainfall prediction after literature review of some related papers.
- Tried various optimisers with different learning rates, used batch normalisation and kaiming initialisation to reduce losses and plotted the R2/RMSE losses and worked on accuracy metrics.

Projects

Stock Price Forecasting | *Supervisor: Dr.J.K.Sahoo* **Sep 2023 - Present**

- Optimising and improvising existing trading model which was based on LSTM and Random Forest.
- Conducted comprehensive literature review, currently working on incorporating sentiment analysis and correlation-based stock grouping to improve the model accuracy.

Optimising TSV placement in 3D NoC | *Supervisor: Prof. Kanchan Manna* **Jan 2023 - Present**

- Conducted extensive literature review of existing application-mapping and latency estimation techniques.
- Currently simulating an application-specific 3D-NoC using Access Noxim and SystemC. Formulated a new loss function for variable TSVs which is being tested.

Arbitrage-free neural-SDE market models | *Supervisor: Dr. Mayank Goel* **Jan 2023 - Present**

- Currently working on combining neural networks with risk models based on classical stochastical differential equations(SDEs), for assessing risk profiles and hedging strategies.

Comparative study between Candle and PyTorch | *Supervisor: Prof. Kunal Korgaonkar* **Aug 2023 - Dec 2023**

- Tested candle (which is a machine learning framework in Rust) against Pytorch.
- Used the principles of programming languages to determine why candle and pytorch are performing the way they are.
- This was a group project, which was part of our CSF301 course.

Microwave Oven Design | *Supervisor: Prof. Anupama K.R.* **Jan 2023 - Present**

- Designed a control system for a microwave oven in verilog HDL.
- The project involved interfacing memory and I/O devices like 2716, 6116, 8259, 8255, 8253, microwave magnetron, and optical relays.
- Our team achieved the highest project score from the Department of Electronics and Electrical Engineering, BITS

Technical Skills

Languages: Python, Java, C/C++, HTML/CSS, Verilog, SQL(Postgres), R
Developer Tools: VS Code, Eclipse, PyCharm, IntelliJ, Xilinx Vivado, Anaconda-Navigator, Android Studio
Technologies/Frameworks: Linux, GitHub
Libraries: Pandas, NumPy, Matplotlib, Pytorch, SciPy, scikit-learn, statsmodel

Relevant Coursework

Digital Design **A**, Object Oriented Programming **A-**, Logic in Computer Science **A-**, Database Management Systems **A-**, Data Structures and Algorithms **A-**, Securities and Portfolio Management **A**, Derivatives and Risk Management **A**, Discrete Structures in Computer Science **A**, Probability and Statistics **A-**, Calculus **A**, Linear Algebra and Complex Analysis **A-**, Differential Equations **A-**, Computer Programming **A-**, Theory of Computation **A-**, Operating Systems **A-**, Computer Networks**, Compiler Construction**, Design and Analysis of Algorithms**, Business Analysis and Valuation**, Financial Management**, Applied Stochastic Processes**

- Courses **In Progress** marked with **

Extracurricular

Abhigyaan **Feb 2022 – May 2023**
Core Member *BITS Pilani*

- Took weekly sessions with underprivileged kids on campus, helping them with academics and social skills. Personally mentored over 7+ kids.

Peer Mentorship Program **Sep 2022 – Present**
Mentor *BITS Pilani*

- Mentoring 8 juniors as a part of the Mentorship Program in academics and career related queries; conducting sessions to guide them further.