Shivam Chadha

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EDUCATION

BITS PILANI, GOA CAMPUS — Goa, India | Expected 2024

MSC. MATHEMATICS | B.E ELECTRONICS AND COMMUNICATIONS
CGPA: 7.95

EXPERIENCE

QUANTUMSTREET AI — Jul'24 - Present
Associate Data Scientist
- Utilized **SHAP** (SHapley Additive exPlanations) to interpret prediction changes as part of a new product
- Part of a new team of three to **monitor model performance** and identify failure points in daily model runs
- Employed **ElasticSearch** to efficiently collect and aggregate data for the development of a knowledge graph

WADHWANI AI — Jan'24 - Jul'24
ML Intern | Advisor : Arvind Balachandrasekaran
- Implemented **tabular data** preprocessing methods to classify student dropout rates in schools across Gujarat
- Applied **Deep Feature Synthesis** (DFS) on tabular datasets for **tree-based models** and achieved an **increase of over 1.5% accuracy** on average
- Worked on new **Tree-Based Kernel Embeddings** to combine Tree-based and Deep Learning models for tabular data

AMAZON — Jul'23 - Dec'23
SDE Intern - Ship Tech (Core Trans Tech)
- Integrated **AWS AppConfig** to Geo Carrier Routing Service (Tier-1) by building a caching client in Java
- Implemented **throttling** for the GCRS service, handling over 1000 TPS, using Spring
- Secured logs of GCRS by integrating an **encryption** service to log confidential customer data

NANYANG TECHNOLOGICAL UNIVERSITY — Nov '21 - May '23
Undergraduate Research Assistant | Advisor: Dr. Yuvraj RajamNickam, Dr. Amalin Prince
- Developed a **classification model** to identify classroom teaching methods based on students' EEG signals.
- Designed and implemented a code pipeline for pre-processing raw **EEG signals** and then extracting Statistical, Fractal Dimension, Entropy, and Higher Order Spectra features
- Developed classification models using **Random Forest, KNN, and MLP** on extracted EEG features, achieving a maximum prediction **accuracy of 78.5%** for classroom teaching methods

NATIONAL INSTITUTE OF ADVANCED STUDIES — May '22 - May '23
Undergraduate Research Assistant | Advisor: Dr.Nithin Nagaraj, Dr. Snehanshu Saha, Dr. Archana Mathur
- Developed novel **pruning** methods (**LEGCNet-FT** and **LEGCNet-PT**) to create pre-set sparse networks that reduce model size while maintaining its performance.
- Achieved network size reduction by incorporating Granger causality with LEGNet-FT and LEGCNet-PT, preserving original performance and **feature explainability**.
- Introduced chaos theory via **Lyapunov Exponents** to identify and prune causal weights responsible for misclassifications.
- Preprint arXiv:2308.09955 [cs.LG]

HERTZTECH SOLUTIONS PVT. LTD. — Jun '21 - Jul '21
Intern
- Worked on a **WaveNet**-based generative model for noise and vibration benchmarking in vehicles.
- Used Magenta (**TensorFlow**) to generate unique time series data from raw audio inputs.

PROJECTS

CHAOSNET Link

- Implemented CHAOSNET, a chaos-based artificial neural network architecture for classification from scratch
- Used the above model for classification tasks on synthetic datasets using single and 2-layer networks

DMD FOR VIDEO BACKGROUND/FOREGROUND SEPARATION Link

- Implemented a DMD (Dynamic Mode Decomposition) model using PyDMD package on CDNET dataset for highway setting
- Successfully separated background and foreground components of video frames

COVID-19 CASES PREDICTOR Link

- Performed EDA on time series data of deaths due to Covid-19 in 2020
- Used ARIMA and SARIMA models to improve on a baseline Naive Bayes model for forecasting deaths due to Covid-19 on a week and a month prediction window
- Performed Dickey-Fuller and KPSS tests to check for stationarity

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SKILLS

- **LANGUAGES:**: Python, MATLAB, C/C++, Java
- **LIBRARIES:**: Numpy, Pandas, Scikit-learn, Matplotlib, PyTorch, CatBoost, TensorFlow, Transformers, Hydra
- **TOOLS:**: Git, Amazon S3, Elasticsearch, Linux, SSH, GCP, AWS

WORKSHOPS

NEURONAL DYNAMICS FOR EMBODIED COGNITION, DFT WORKSHOP 2022 AUG '22

- Virtual summer school mainly focused on the basics of dynamic field theory and applications in embodied cognition, cognitive science, developmental science, cognitive neuroscience, developmental robotics, autonomous robotics, and cognitive robotics, organized by Prof. Gregor Schöner
- Implemented a DFT architecture for simulating basic Visual Search and Spatial Language recognition using CEDAR

TEACHING ASSISTANT-SHIPS

WORK INTEGRATED LEARNING PROGRAMS (WILP) - CALCULUS FEB '22 - JUN '22

- Took 8 TA hours per week to assist over 500 students with their problems
- Evaluated mid-semester and end-semester assessments
- Took sessions to introduce and help familiarize MATLAB to students

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ACHIEVEMENTS

ASCII PROJECT MENTOR AUG '22 - DEC '22

- 1 among 20 mentors chosen from over 600 students to guide students of the Computer Science Department on the Chaos Dynamics project as part of the ASCII Mentorship program on recommendation from Dr. Snehanshu Saha

AMAZON ML SUMMER SCHOOL JUNE 2022

- Was one among 3000 students selected to attend Amazon ML Summer School after a test taken for undergraduate students all over India

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COURSEWORK

- **Data Science:** Machine Learning, Foundations of Data Science, Applied Statistical Methods, Applied Stochastic Processes, Optimization
- **Major:** Numerical Analysis, Probability and Statistics, Digital Signal Processing, Linear Algebra, Multivariate Calculus, Discrete Mathematics, Introduction To Functional Analysis, Ordinary Differential Equations, Control Systems