Shivam Chadha

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EDUCATION

BITS PILANI, GOA CAMPUS Goa, India | Expected 2024

MSC. MATHEMATICS | B.E ELECTRONICS AND COMMUNICATIONS
CGPA: 7.73

EXPERIENCE

WADHWANI AI Jan'24 - Present
ML Intern | Advisor : Arvind Balachandrasekaran
- Studying the effects of Deep Feature Synthesis (DFS) on tabular data for tree-based models
- Setting up an end-to-end pipeline to use DFS to predict student dropout in schools
- Working on extracting Kernel Embeddings from Random Forests to use them as inputs for Neural Networks

AMAZON Jul'23 - Dec'23
SDE Intern - Ship Tech (Core Trans Tech) | Manager : Satyabrata Samantaray
- Integrated AWS AppConfig to a Tier-1 Service by building a caching client in Java
- Introduced throttling functionality for Tier-1 service using Spring
- Secured logs of Tier-1 services 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
Project Title: Analysis of real-world Classroom 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
- Built classification models using Random Forest, KNN, and MLP on extracted features from the EEG signals to predict the method of teaching used in the classroom

HERTZTECH SOLUTIONS PVT. LTD. Jun '21 - Jul '21
Intern | Advisor: Dr. Kamlesh Tiwari, Dr. Karthik Kappaganthu
Project Title: Time Series Analysis Using WaveNet
- Used WaveNet model to detect anomalies in mechanical and electronic machines using their vibrations and raw audio
- Processed MIDI files to produce time series representing a sound wave

PROJECTS

CHAOS CAUSALITY BASED NEURAL NETWORK PRUNING
- Explored the underlying learning dynamics and investigated the chaotic dynamics of artificial neural networks
- Designed and implemented a code pipeline for measuring the change in Lyapunov Exponents in the connections during the course of training
- Created a novel method for creating pre-set sparse networks that reach benchmarked accuracies comparable to the dense network, if not faster
- Preprint arXiv:2308.09955

ASR USING WHISPER
- Fine-tuned Whisper model for Medical Speech Recognition task.
- Curated a pipeline to generate transcripts of medical audio using the fine-tuned Whisper model.
- Classified Medical Symptoms from the transcript by incorporating an additional BERT model.

CHAOSNET

- Implemented 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

- 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

- 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

SKILLS

- **LANGUAGES:**: Python, MATLAB, C/C++, Java
- **LIBRARIES:**: Numpy, Pandas, Scikit-learn, Matplotlib, TensorFlow, PyTorch
- **TOOLS:**: Shell Scripting, Git

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

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

COURSEWORK

- **Data Science:** Machine Learning, Foundations of Data Science (ongoing), 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