Nirlipta **Pande**

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Education

Birla Institute of Technology and Science Pilani (BITS Pilani) *Pilani, India*

(Dual Degree) B.Eng. in Computer Science, M.Sc. in Economics *Aug. 2017 - July 2022*

- CGPA: 8.66/10

Publications

Investigating causal effects of anthropogenic factors on global fire modeling *TU Wien, Austria*

Nirlipta Pande and Wouter Dorigo *28 April, 2023*

EGU General Assembly, 2023

Effect of Socioeconomic Variables in Predicting Global Fire Ignition Occurrence *TU Wien, Austria*

Tichaona Mukunga, Matthias Forkel, Matthew Forrest, Ruxandra-Maria Zotta, Nirlipta Pande, Stefan Schlaffer and Wouter Dorigo *10 May 2023*

MDPI Fire

Research Projects

FURNACES *TU Wien*

Prof. Wouter Dorigo *August 2022- July 2023*

- Quantifying anthropogenic effects for global ignition models
- Proposed and incorporated an intersection of structural causal modelling and parameter learning. This will help to distinguish mediating effects of socioeconomic factors as opposed to quantifying the confounding effects of climatology and vegetation in global ignition models.
- Model optimization pipelining to reduce the runtime to one-tenth. Gap-filling the spatiotemporal data using splines which increased the accuracy by 5%

Scalable OPTRAM Model and forecasting of Sentinel-2 tiles *BOKU, Vienna*

Prof. Clement Atzberger *June 2021-July 2022*

- Implemented the Optical Trapezoid Model(OPTRAM) for remote-sensing of soil using the time-series Sentinel-2 dataset. The model was optimized and pipelined such that it provided more accurate results while decreasing the run-time to one-fifth of the original. This allowed us to scale up the model which is currently being implemented in the main system to provide real-time crop assessments.
- Created end-to-end pipeline for forecasting Sentinel-2 products while using neural processes for gap filling and forecasting using additive model variations of Prophet and AutoARIMA. This was done as a part of my bachelor's thesis

GDP Nowcasting *BTH, Karlskrona*

Dr. Prashant Goswami *July 2021-December 2021*

- Forecasted Indian GDP using Deep Dynamic Factor models using 2-step aggregation and autoencoders. This showed gains in-sample and out-of-sample predictions. The turning points were better predicted better by using more leading and contemporaneous indicators like housing sales and new registered number of startups.

Crop Yield Prediction using big data analytics *BITS Pilani*

Prof. Navneet Goyal *August 2020 - May 2021*

- This project was split into two parts. The first part involved data mining of the reference sentinel dataset and implementation of You et al. in Pytorch. After spatiotemporal modelling of data using Gaussian processes, hybrid models combining ARIMA and LSTM were used to extract the underlying linear moving averages and non-linear parts respectively.
- The literature review involved the implementation of several underlying concepts of using Big Data for advanced data analytics and use it for predictive and user-behaviour analytics. This included time-series classification for user behaviour.

Intelligent Data Analytics for Air Quality Monitoring *Pilani*

CEERI, Pilani *May 2019 - July 2019*

- The aim of this research Internship was to design fusion nets using neural networks to model the spatial and temporal air pollution data. Data from sensors strategically placed at various points was used as input to predict the next 48-hour quality of air. Since the project was in the early leg of its implementation, it involved an extensive literature review and implementation of RNNs and other forecasting algorithms.

Jevons Paradox In Residential Sector *BITS Pilani*

Dr. Monika Gupta *January 2019 - May 2019*

- This project was aimed at finding empirical evidence for analysing the rebound effect in the household electricity sector. This project exposed me to various data collection techniques and ways to analyse cross-sectional data. It gave an introduction to Behavioral Economics and Stata and an overview of advanced econometric techniques as the model required an understanding of the Vector Error Correction Model and other prerequisites.

Learning Projects

Portfolio Optimization using Q-Learning

BITS Pilani

Study Project

- Built a thorough account of the performance of ML techniques for portfolio optimization versus methods like the Markowitz model
- Implemented Q-learning, a reinforcement learning algorithm, on NIFTY 50 data to optimize Sharpe & differential Sharpe ratios

Compiler Construction for a Custom Language

Compiler Course

- Created a compiler for a strongly-typed language that supports basic datatypes, arithmetic expressions, functions and iterations
- Implemented the working of a lexer, semantic analyzer (for AST generation, type checking, etc) and assembly code generator

Project Erlebnisse

BITS Pilani

Microsoft Codefundopp *June 2019 - August 2019*

- Built an e-voting application using Ethereum Blockchain protocol and deployed it on Microsoft Azure
- Gained expertise in blockchain, hashing algorithms and other security protocols.
- Hands-on experience with Solidity, blockchain technology internals, expertise on smart contracts.

Skills

Programming	Python, JAVA, C, R, MATLAB, Javascript, Stata, LaTeX
Frameworks	Pytorch, TensorFlow, Keras, Scikit, Django, NodeJS
Areas of Interest	NLP, Causal Inference, Cognitive neuroscience, Deep Learning, Optimization

Relevant Coursework

Computer Science	Engineering Calculus, Linear Algebra, Differential Equations, Probability and Statistics, Data Structure and Algorithms, Design and Analysis of Algorithms, Operating Systems, Computer Architecture, Computer Networks, Computer Programming, Object Oriented Programming, Artificial Intelligence, Database Systems
MOOCs	fastai, Reinforcement Learning; Neural Networks and Deep Learning; Improving Deep Neural Networks: Hyperparameter tuning, Regularization and Optimization; Structuring Machine Learning Projects; Probabilistic Graphical Models Specialization
Economics	Forecasting Methods, Econometric Methods, Applied Econometrics, Economic Analysis of Public Policy, Issues in Economic Development, International Business, Mathematical and Statistical Methods, Money Bank and Financial Markets, International Economics, Financial Management

Volunteer Experience

Student Faculty Council

BITS Pilani

Core Team Member *January 2021 - August 2021*

- Member of the Student Faculty Council of the Department of Computer Science and Information Systems, BITS, Pilani, comprising of the Head of Department, senior professors as well as top performing students
- Acted as a bridge between the students and the professors and hence, improving the research environment on the campus by suggesting important reforms, both academic and non-academic.
- Tackled issues faced by students first-hand and provided a student-centred perspective for the education methodology and content being followed. This was a cornerstone during COVID, when learning paradigm shifted to an online platform

Computer Science Association

BITS Pilani

President and Alumni Research Talks Coordinator *January 2019 - December 2020*

- Headed a group of 30 students into organizing 3 events like MindTurner, a 48 hour 25 riddle long spree which attracted over 400 students
- Organized an event to promote research interest among students at BITS Pilani
- Talks and interactive sessions by multiple ex-BITSians with various research labs around the world.

BITS Embryo

BITS Pilani

Website Development Team Head *January 2019 - May 2020*

- Lead a team of developers for the development and maintenance of the official BITS Embryo Website.
- Official Portal to get details of upcoming and previous talks and to register a new talk

National Service Scheme, BITS Pilani

BITS Pilani

Core Team Member *August 2017 - January 2019*

- Member of the Computer Literacy Programme.
- Provided computer literacy to the over 50 underprivileged of Pilani and nearby.
- Taught basic programming principles to 15 teenagers in C++