

Nilanjan

Debnath



14 October 1996



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Education

Masters of Science | Data Science
Chennai Mathematical Institute |
2019-Present

Bachelors of Science |
Mathematics(major) with Statistics
and Economics(minors)
St. Xavier's College | 2014-2017

Higher Secondary Education
Don Bosco School, Bandel | 2014

Secondary Education
Don Bosco School, Bandel | 2012

Skills

Languages: Python, R, CQL, Octave,
Java, C
Other: MS Office, Git

Positions of Responsibility

Core Committee Member @ Tessellate
2020

- Organizer of Treasure Hunt
- Volunteer at Chess and Cubing

Core Committee Member @ Analytica
2017

- Organizer of conclave forums & talks
- Handled logistics & speakers

Captain of the St. Xavier's College,
Table Tennis Team 2016-17

Member of the St. Xavier's College,
Table Tennis Team 2015-17

Member of Chandannagar Team for
Intra State Table Tennis Tournament
2016,2015,2010,2009

Core Committee member of Bosco
Xprezns 2013

Core Committee member of the Don
Bosco Cyber Club 2012-2014

Research and Projects

- Oct '20-Dec '20 Beijing Air Quality Analysis under Prof. Sourish Das at Chennai Mathematical Institute, Chennai
Beijing has constantly ranked as one of the most polluted cities on the planet. Here, we analyze the data from 12 different locations in and near Beijing and compare it to the official data released by the China Meteorological Administration in hopes of learning more about the pollutant $PM_{2.5}$ and also finding the distribution of the other pollutants during that period of time.
- Oct '20-Dec '20 Crawling with Apache Nutch under Prof. Venkatesh Vinayakrao, Chennai Mathematical Institute, Chennai
Apache Nutch is a well-established web crawler based on Apache Hadoop. As such, it operates by batches with the various aspects of web crawling done as separate steps (e.g. generate a list of URLs to fetch, parse the web pages, and update its data structures.) Our task here is to build a small scale web crawler with the help of Apache Nutch.
- Dec '20 - Present Deep Learning for Self Driving Cars
Learning how self driving cars operate on road with help of CNN based on End to End learning of Self Driving Cars and Udacity's self driving car nanodegree. We trained a convolutional neural network (CNN) to map raw pixels from a single front-facing camera directly to steering commands.
- Mar'20-Apr '20 Graph Databases and Neo4j under Prof. Venkatesh Vinayakrao, Chennai Mathematical Institute, Chennai
A graph database is an online database management system with Create, Read, Update and Delete (CRUD) operations working on a graph data model. Unlike other databases, relationships take first priority in graph databases. Our aim in this project is to explain the usage of Neo4j using Cypher and in the process, graph databases itself.
- Mar'20-Apr '20 Matrix factorization techniques for recommender systems under Prof. Venkatesh Vinayakrao, Chennai Mathematical Institute, Chennai
As the Netflix Prize competition has demonstrated, matrix factorization models are superior to classic nearest-neighbor techniques for producing product recommendations, allowing the incorporation of additional information such as implicit feedback, temporal effects, and confidence levels.
- Mar '20-Apr '20 The Linear algebra behind search engines under Prof. Kavita Sutar, Chennai Mathematical Institute, Chennai
Information Retrieval and basic components of search engines. We will focus on one particular search engine model, Vector Space Model. We will also focus on an advanced vector space model called Latent Semantic Indexing which helps improve our search results
- Feb '20-Mar '20 Summary of the paper "Learning to Interpret Satellite Images using Wikipedia" by Buraz Uzunet, Evan Sheehan, Chenlin Meng, Zhongyi Tang, Marshall Burke, David Lovell, Stefano Ermon from Stanford University
Finding labelled datasets to train models in Computer Vision is really difficult and is anyway very costly. Secondly finding labelled dataset for satellite images are even more difficult since humans are unfamiliar with aerial photographs. In this paper, the authors show how pairing Wikipedia articles to satellite images performs better than pre-training on an existing dataset.
- Aug '20-Nov '20 Series of videos on Information Retrieval
Published a short series of videos on youtube about information retrieval

Research and Projects*(continued)

Jan-April'17 Final Semester Dissertation under Prof. Diptiman Saha, Department of Mathematics, St. Xavier's College, Kolkata
Using LU decomposition to find the solution of a system of equations. In numerical analysis and linear algebra, LU decomposition or factorization, discovered by Tadeusz Banachiewicz, factors a matrix as the product of a lower triangular matrix and an upper triangular matrix. It can also be viewed as a form of Gaussian Elimination. Programmed LU Decomposition in C.

Internships

Dec '20 - Present Teaching Assistant
Teaching assistant for Msc. first year course Mathematical Analysis under Prof. Sundareswaran Ramasubramanian

May '20 - Jul '20 Machine Learning Internship, Coriolis Technologies, Pune
Used NLP models from Spacy and Polyglot for Named Entity Recognition to identify entities like names, addresses, locations. Used Microsoft Presidio to find structured entity types like PAN Card, Aadhar card, Driving License numbers. Finally used a neural network on OCR results to classify the documents. Also contributed to Microsoft Presidio open source by adding recognition and validation for Indian Personally Identifiable Data.

Dec'19 - Jan'20 Machine Learning Internship, Machine Intelligence Unit, Indian Statistical Institute, Kolkata
Interned at MIL,ISI Kolkata under Prof. Ashish Ghosh on Data Pre-Processing(Data Cleaning, Data Transformation and Data Reduction),Pattern Recognition and Data Classification based on Bayes Decision Theory.

Achievements

2017 AIR 3
Indian Army LDC appointments 2017

2013 Winner
Inter School Creative Writing Competition held at IIPM Kolkata

2013 Runners Up
Intra School Debate Tournament held at Don Bosco School, Bandel

2011 Winner
Inter School Theatrical Production held at Don Bosco School, Park Circus

Social Responsibilities

Founder Aastha Academy, Chandannagar, West Bengal
Led a team of 4 to make one of the fastest growing education center for underprivileged children in the area.
Spearheaded the spread of information among the deprived sections of the society about the importance of child education.

Working Member All India Catholic University Federation
Collaborated with a team of 15 to visit Ghostomath. A remote village to teach, interact and impart knowledge to the local village children, while also simultaneously instilling a sense of rooted social commitment.
Collaborated with a team to visit St. Joseph's Old Age Home, to lend a helping hand to all the residents.

Working Member National Service Scheme
Collaborated with a team of five who were given the responsibility to look over the delegation from Gostomath during the Children's fair for underprivileged children at St. Xavier's College, Kolkata.