

Nilanjan

Debnath



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Education

Masters of Science | Data Science
Chennai Mathematical Institute |
2019-2021

Bachelors of Science | Mathematics
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

Captain of the Don Bosco Bandel
Table Tennis Team 2010

Research and Projects

Feb '21- May '21 Image captioning with Attention under Prof. Kavita Sutar at Chennai Mathematical Institute, Chennai

In this project, our algorithm learns to selectively attend to semantic concept proposals and fuse them into hidden states and outputs of recurrent neural networks.

Feb '21- May '21 Building a character language model under Prof. Ramaseshan Ramachandran at Chennai Mathematical Institute, Chennai

In this project we first build a language model (bigrams and trigrams) using the covid 19 paper corpus, build a knowledge graph from it and then finally build a character based language model using recurrent neural networks.

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.

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

Aug '20-Nov '20 Series of videos on Information Retrieval
Published a short series of videos on youtube about information retrieval

Internships

May '21 - Present Research Internship, Indian Statistical Institute
Clustering streaming data using Decision Theoretic Rough Sets under Prof. Ashish Ghosh, Machine Intelligence Unit

Feb '21 - May '21 Machine Learning Internship, DeLab Research
Machine Learning intern at DeLab Research working on using Neural Networks using regression and time series to accurately predict and forecast renewable energy production for the next day.

Dec '20 - April '20 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.

Dec '19 - Jan '20 Machine Learning Reading Project, Machine Intelligence Unit, Indian Statistical Institute, Kolkata
Data Pre-Processing (Data Cleaning, Data Transformation and Data Reduction), Pattern Recognition and Data Classification based on Bayes Decision Theory.

Talks given

May 19, 2021 Talk on Reinforcement Learning, DeLab Research

Gave a talk on the introduction to Reinforcement learning using Multi Arm Bandits, Markov Decision Process, Monte Carlo methods and Temporal Difference Learning

Achievements

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| 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 |

Courses Taken

Former Courses Reinforcement Learning, Computer Vision, Natural Language Processing, Bayesian Data Analysis, Advanced Machine Learning, Time Series Analysis, Predictive Analytics, Information Retrieval, Data Mining and Machine Learning, Numerical Linear Algebra, Mathematical Methods and Analysis, Probability and Statistics, Algorithms, Programming and Data Structures with Python, Big Data, Relational Database Management Systems, Data Visualization, Discrete Mathematics

Social Responsibilities

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| 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. |