

# Nilanjan Debnath

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## EDUCATION

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### The University of Texas at Dallas

*PhD in Management Science*

Dallas, Texas, USA

*Aug. 2022 – Present*

### Chennai Mathematical Institute

*Master of Science in Data Science*

Chennai, Tamil Nadu, India

*Aug. 2019 – May 2021*

### St. Xavier's College

*Bachelor of Science in Mathematics*

Kolkata, West Bengal, India

*Aug. 2014 – May 2019*

### Don Bosco School

*Higher Secondary Degree*

Bandel, West Bengal, India

*March. 2012 – March 2014*

### Don Bosco School

*Secondary Degree*

Bandel, West Bengal, India

*March. 2002 – March 2012*

## EXPERIENCE

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### CAE Analyst

*Mercedes Benz, R&D India*

February 2022 – Present

*Bangalore, India*

- Analyzing Mercedes Benz and competitor carlines for ergonomic satisfaction
- Automating detection of ingress-egress using motion capture data
- Conducting Machine Learning bootcamps for other members of the team

### Research Intern

*Indian Statistical Institute*

May. 2021 – Present

*Kolkata, India*

- Clustering streaming data using decision theoretic rough sets.
- Done under the supervision of Prof. Ashish Ghosh, Machine Intelligence Unit
- Manuscript under works

### Machine Learning Intern

*DeLab Research*

January 2021 – April 2021

*Trivandrum, India*

- Used neural networks for regression, and time series to accurately predict and forecast renewable energy production for the next day
- Accurately predicted solar energy production better than state of the art industry standard.

### Teaching Assistant

*Chennai Mathematical Institute*

December 2020 – April 2021

*Chennai, India*

- Teaching assistant for master in science, first year course mathematical analysis under Prof. Sundareswaran Ramasubramanian

### Machine Learning Intern

*Coriolis Technologies*

May 2020 – July 2020

*Pune, India*

- 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.
- Used a neural network on OCR results to classify the documents.

### Reading Project

*Indian Statistical Institute*

December 2019 – January 2020

*Kolkata, India*

- Data pre-processing(data cleaning, data transformation and data reduction).
- Data classification based on Bayes decision theory.
- Done under the supervision of Prof. Ashish Ghosh, Machine Intelligence Unit, Indian Statistical Institute, Kolkata, India

## PROJECTS

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### Image Captioning with Attention

January 2021 – April 2021

- Comparison of image captioning using attention and without attention
- Showcasing the problems with BLUE, METEOR and CIDEr forms of evaluating output captions
- Done under the supervision of Prof. Kavita Sutar, Chennai Mathematical Institute, Chennai, India.

### Building a character language model

January 2021 – April 2021

- Built a language model (bigrams and trigrams) using the covid 19 paper corpus.
- Used the language model to build a knowledge graph from it.
- Finally, built a character based language model using recurrent neural networks.
- Done under the supervision of Prof. Ramaseshan Ramachandran, Chennai Mathematical Institute, Chennai, India

### The Linear Algebra behind search engines

January 2020 – April 2020

- We used vector space model and an advanced vector space model called, latent semantic indexing to improve search results.
- Showcased the difference in results using different vector space models.
- Finally used relevance feedback to improve the model.
- Done under the supervision of Prof. Kavita Sutar, Chennai Mathematical Institute, Chennai, India

### Crawling with Apache Nutch

September 2020 - December 2020

- Our task here was to build a small scale web crawler with the help of Apache Nutch.
- Done under the supervision of Prof. Venkatesh Vinayakarao, Chennai Mathematical Institute, Chennai, India

### Series of videos on Information Retrieval

September 2020 – December 2020

- Published a short series of videos on youtube about information retrieval

### Link for project reports

## TALKS GIVEN

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### Introduction to Reinforcement Learning

19 May, 2021

*DeLab Research*

*Trivandrum, India*

- 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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Eugene McDermott Fellow, The University of Texas at Dallas	2022
All India Rank 3, Chennai Mathematical Institute Entrance Examination	2019
All India Rank 3, Indian Army LDC Appointments	2017
All India Rank 2, Tolani Maritime Institute Entrance Examination	2014
Qualified for JEE Advanced (Top 20 percentile)	2014
Represented school, college and district in various state level table tennis tournaments	2008-17

## TECHNICAL SKILLS

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**Languages:** Python, R, MATLAB, Octave, Java, C/C++, CQL

## SOCIAL RESPONSIBILITIES

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### Aastha Academy

Founder

- Led a team of 4 to make one of the fastest growing education centres for underprivileged children in the area.
- Spearheaded the spread of information among the deprived sections of the society about the importance of child education.

### All India Catholic University Federation

Working Member

- Collaborated with a team of 15 to visit Ghostomath, a remote village in the suburbs of rural Kolkata, 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.

### National Service Scheme

Working Member

- 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.