

# PRATIK KARMAKAR

PhD Student | MSc in Big Data Analytics | BE in Electrical Engineering

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📍 Singapore

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## RESEARCH INTEREST

Data Quality Management & Data Valuation in Databases and Machine Learning, Privacy Preserving Artificial Intelligence, Optimization for Machine Learning and Deep Learning

## PROJECTS

- **Expected Shapley-Like Scores of Boolean Functions: Complexity and Applications to Probabilistic Databases)**
  - Defining expected Shapley-like scores (including Banzhaf index) for queries on the tuples of a probabilistic database.
  - Computing expected Shapley-like scores on probabilistic databases in polynomial time.
  - Implementing the computation in [ProvSQL](#).
- **Marich: A Query-efficient Max-Information Model Extraction Attack using Public Data (NeurIPS 2023)**
  - Model extraction attack with minimum query budget
  - Model extraction using min-max game to minimize loss between target and attacker model and maximize information leakage
  - Use of Active Sampling methods to minimize query budget by sampling high information queries
- **Optimisation Algorithms Insights**
  - Analysis of optimization algorithms used in Machine Learning and Deep learning through visualisation (in Python)
- **A lucid visual walk through Fourier Transform**
  - Analysis and explanation of Fourier Transform through visualization in Python

## EDUCATION

PhD in Computer Science

School of Computing, National University of Singapore

📅 January 2023 – Present

📍 Singapore

CGPA 4/5

MSc in Big Data Analytics

Ramakrishna Mission Vivekananda Educational and Research Institute

📅 September 2020 – July 2022

📍 Belur, India

CGPA 9.25/10

BE in Electrical Engineering

Jadavpur University

📅 Aug 2014 – June 2018

📍 Kolkata, India

CGPA 8.58/10

Higher Secondary (10+2)

Barrackpore Govt. High School

📅 – 2013

📍 Barrackpore, India

Percentage 85.4%

Secondary (10)

Bhatpara Amarkrishna Pathsala

📅 – 2011

📍 Bhatpara, India

Percentage 82.25%

## GRADUATE COURSEWORK

- Linear Algebra
- Optimization for Machine Learning
- Data Structures and Algorithms
- Probability and Stochastic Process
- Multivariate Statistics
- Advanced Statistical Methods
- Machine Learning
- Computer Vision
- Optimization Algorithms
- Online Learning
- Artificial Intelligence
- Deep Learning and Neural Networks II
- Uncertainty Modeling in AI

## TEACHING EXPERIENCE

Teaching Assistant (as a PhD Student) for courses:

- Data Management and Warehousing
- Database Applications Design and Tuning
- Database Technology and Management

## TECHNICAL SKILLS

- Python
- R
- PostgreSQL
- Neo4j

## WORK EXPERIENCE

Trainee Data Scientist

Abzooba India Infotech Pvt. Ltd.

📅 July 2022 - Dec 2022 📍 Kolkata, India

Developing a data imputation framework for general use in the company's business use cases.

Graduate Engineer Trainee

Vedanta Aluminium Ltd.

📅 Sept 2018 - Feb 2019 📍 Odisha, India

Managed a team for operations and maintenance of Ash Handling Plant and Coal Handling Plant of a power plant (Electrical Department)

Summer Intern

Defence Research and Development Organization

📅 May 2017 - June 2017 📍 Hyderabad, India

Design of Brushless DC Motors for Tactical Aerospace Vehicle