

PRATIK KARMAKAR

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

@ pkpratikkarmakar@gmail.com

pratik.karmakar@u.nus.edu

+91 6290517961/ +65 86695024

Singapore

pk-pratik-karmakar

https://gitlab.com/pkpratikkarmakar

github.com/pratik2358

RESEARCH INTEREST

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

PROJECTS

- **Using a Probabilistic Database in an Image Retrieval Application**
 - Utilizing probabilistic data generated by YOLOv5 model for better explanation and fine grained reliability of decision making.
 - Using ProvSQL to compute the probabilities and expected Shapley values in an image retrieval system.
- **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)

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

TECHNICAL SKILLS

- Python
- R
- PostgreSQL
- Neo4j

GRADUATE COURSEWORK

- Optimization for Machine Learning
- Data Structures and Algorithms
- Probability and Stochastic Process
- Multivariate Statistics
- 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

AWARDS

- Research Achievement Award in the Academic Year 2023/2024 by the School of Computing, NUS
- Teaching Fellowship Scheme awarded by the School of Computing in 2024/2025 Semester 1

WORK EXPERIENCE

Trainee Data Scientist

Abzooba India Infotech Pvt. Ltd.

July 2022 - Dec 2022 Kolkata, India

Developed a data imputation framework for general use in the company's business use cases and mentored two interns on projects focused on Explainable AI.

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