Dhanus M Lal

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SUMMARY

I am an MSc(Research) mathematics student at IISc, Bangalore. I am looking for placements in areas related to mathematics/theoretical computer science/data science.

EDUCATION

Bachelor of Science (Research) CGPA - 8.8
Indian Institute of Science, Bengaluru
Major: Mathematics

Higher secondary[ISC] 96%
St. John's Residential School, Kollam, Kerala

High school[CBSE] CGPA - 10
City Central School, Kollam, Kerala

SKILLS

Programming Languages & Packages: C, C++, Python, MATLAB, LaTeX, NumPy, SciPy, pandas, PyTorch, MPI, OpenMP, Git.

Operating Systems: Windows, Linux.

Mathematical skills: Very strong mathematical background, Linear Algebra, Measure Theory, Probability Theory, Machine Learing, Sparse Recovery.

Other skills: Typing speed: 65 WPM

PROJECTS

Spectral Clustering Jul 2022 – present
Advisor: Ambedkar Dukkipati, CSA Department, IISc, Bengaluru.

BSc thesis project on compressed sensing Jan – May 2022
Advisor: Manjunath Krishnapur, Department of Mathematics, IISc, Bengaluru.

- Techniques for recovering sparse signal from a linear measurement.
- Explored how geometry of the set of sparse vectors guarantee exact recovery using basis-pursuit.

Dimensionality reduction: Machine learning course project Mar – May 2022
Advisor: Chaitanya Murti, CSA Department, IISc, Bengaluru.

- Analyzed and implemented various dimensionality reduction techniques on CIFAR-10 dataset.
- Performance of each method was compared using various linear and non-linear classifiers.
- Dimensionality reduction methods studied: PCA, kernel-PCA, linear discriminant analysis, autoencoders and Johnson Lindenstrauss lemma.

Reading project on Zorn's lemma Jul – Aug 2021
Advisor: Arvind Ayyer, Department of Mathematics, IISc, Bengaluru.

- Explored the equivalence between Zorn's lemma, axiom of choice and well ordering principle.

Modelling Bernoulli bond percolation in 2-dimensional lattice Jun – Oct 2020
Github repository is linked here

- Used C and python to estimate percolation threshold in a 2D lattice

Developed a simple board game using python May – Jun 2020
Github repository is linked here.

Reading project on probability thoery Jun – Aug 2019
Advisor: Arvind Ayyer, Department of Mathematics, IISc, Bangalore

- Explored elementary topics in probability theory.
- Baye's theorem, conditional probabilities, conditional expectation, etc.

ACHIEVMENTS

Keysight IoT challenge 2019 entry accepted
Distributed Real-Time Air Quality Indexing System concept accepted as an entry in the smart land category of Keysight IoT challenge (linked here)

Kishore Vaigyanik Protsahan Yojana (KVPY) fellow
Qualified KVPY exam in 2018 with all india rank 61.

OTHER ACTIVITIES

Performed Belousov-Zhabotinsky reaction as an exhibit in the UG chemistry lab during open day IISc, 2020

Volunteered for various events in the UG cultural and tech fest *Pravega 2018 and 2019* at IISc.

Participated in *National Science Camp (Vijyoshi)* 2018 organized by KVPY.

Represented City Central School in *South Zone Sahodaya sports meet* for the events long jump, 100m sprint and 4×100m relay.