

# Dhanus M Lal

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<b>SUMMARY</b>	I am an MSc(Research) mathematics student at IISc, Bangalore. I am looking for internships or placements in areals related to mathematics/data science.	
<b>EDUCATION</b>	<i>Bachelor of Science (Research)</i>	CGPA - 8.8
	Indian Institute of Science, Bengaluru	
	Major: Mathematics	
	<i>Higher secondary</i> [ISC]	96%
	St. John's Residential School, Kollam, Kerala	
	<i>High school</i> [CBSE]	CGPA - 10
<b>SKILLS</b>	City Central School, Kollam, Kerala	
	<i>Programming Languages &amp; Packages:</i> C, C++, Python, MATLAB, $\text{\LaTeX}$ , numpy, scipy, pytorch, MPI, OpenMP.	
	<i>Operating Systems:</i> Windows, Linux.	
	<i>Mathematical skills:</i> Very strong mathematical background, Linear Algebra, Measure Theory, Probability Theory, Machine Learning, Sparse Recovery.	
<b>PROJECTS</b>	<i>Other skills:</i> Typing speed: 65 WPM	
	<i>Thesis project on compressed sensing</i>	Jan – May 2022
	Advisor: Manjunath Krishnapur, department of mathematics, IISc, Bengaluru.	
	<ul style="list-style-type: none"><li>• Techniques for recovering sparse signal from a linear measurement.</li><li>• Explored how geometry of the set of sparse vectors guarantee exact recovery using basis-pursuit.</li></ul>	
	<i>Dimensionality reduction: Machine learning course project</i>	Mar – May 2022
	Advisor: Chaitanya Murti, CSA department, IISc, Bengaluru.	
	<ul style="list-style-type: none"><li>• Analyzed and implemented various dimensionality reduction techniques on CIFAR-10 dataset.</li><li>• Performance of each method was compared using various linear and non-linear classifiers.</li><li>• Dimensionality reduction methods studied: PCA, kernel-PCA, linear discriminant analysis, autoencoders and Johnson Lindenstrauss lemma.</li></ul>	
	<i>Reading project on Zorn's lemma</i>	Jul – Aug 2021
	Advisor: Arvind Ayer, department of mathematics, IISc, Bengaluru.	
	<ul style="list-style-type: none"><li>• Explored the equivalence between Zorn's lemma, axiom of choice and well ordering principle.</li></ul>	

*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 theory* 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.

**ACHIEVEMENTS** *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)

*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.

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