

## **Contact**

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## **Work Experience**

### **C++ Software Developer**

*Qaulity Positioning Systems Maritime Solutions*

2023/08/01 - Present

- \* develop/debug C++ Qt code of sonar data-processing pipelines, data-visualization renders, and GUI.
- \* work with an international team of software engineers on QPS flagship products Qimera and Fledermaus.
- \* perform code-review, participate in daily-standups, respond to assigned JIRA tickets in a timely fashion.
- \* maintain cross-platform compatibility throughout the development process. ensure contributed code passes tests.
- \* test, debug, and profile code using GDB, Perf, and Python to examine bugs and bottlenecks.
- \* discover and report new bugs. learn about the massive library of features within the product, understand their context in Hydrography/Bathymetry.

### **C++ Software Developer**

*Radio Western*

2018/10/01 - 2023/09/01

- \* developed REST-APIs for streaming XML data.
- \* worked on middleware solutions that integrated with NGINX and MySQL.
- \* developed drivers for testing USB cameras, microphones, and SPDT relays.
- \* ported code from Windows to MacOS.
- \* integrated C++ backend with GUIs and APIs written in MacOS's Objective-C frameworks.
- \* learned about some nuanced but interesting topics of audio and video programming such as handling ID3 tags, audio-video synchronization, software encoders, real-time filters, and text-to-speech conversion.
- \* worked with Nginx config files, daemon config files, crontab files.

### **Web Developer and System Administrator (part-time)**

*Schulich School of Medicine & Dentistry*

2022/11/01 - 2023/09/01

- \* assisted researchers with scaling up their full-stack Javascript web app.
- \* took the lead on configuring and integrating a MongoDB server with the NodeJS backend.
- \* took the lead on a React project's frontend for visualizing a million records.
- \* refactored code to compartmentalize api endpoints, improve testability, reduce disk access, and reduce resource consumption.

\* decreased downtime of servers and assisted with establishing a fail-safe redundancy system.

## **Education**

### **MSc. Applied Math, Computational Biology**

*University of Western Ontario*

2016/09/01 - 2018/08/01

GPA 3.9/4.0

### **BSc. (Hons.) Physics**

*Chennai Mathematical Institute*

2011/08/01 - 2014/04/01

GPA 7.48/10.0

## **Academic Projects**

### **Time-Series Analysis of Population Dynamics**

*University of Western Ontario, London*

2016/09/01 - 2018/08/01

Advisor: Dr. Geoff Wild

Developed a non-linear mathematical model of predator-prey interactions. Performed large-scale simulations on compute clusters to generate time-series data points. The time-series was examined with analytical tools such as Poincaré Maps, Lyapunov Exponents, Surrogate Data Analysis, Principal Component Analysis, Dimensionality Reduction, Recurrence Plots and Correlation Integral Plots. The objective was to identify chaotic signatures in population dynamics.

### **Ginzburg-Landau Theory of Superconductivity**

*Institute of Mathematical Sciences, Taramani*

2015/05/01 - 2016/05/01

Advisor: Dr. Gautam Menon

The GL theory of superconductivity is a thermodynamic model that aims to explain macroscopic properties of superconductivity from Landau's theory of Phase transition. The GL model was applied towards modeling the Normal-Superconducting Interface in the microscopic regime of a Single Vortex to obtain a variational solution for the order parameter that yielded results of good approximation.

### **Molecular Dynamics Simulation of Annealing of Glass**

*Institute of Mathematical Sciences, Taramani*

2013/08/01 - 2014/05/01

Advisor: Dr. Satyavani Vemparala

Molecular Dynamics Simulations of crystalization of glass was performed on large compute-clusters. Results were corroborated with experimental collaborators from Indian Institute of Technology, Madras. The objective was to identify quantitative

thresholds in the manufacturing processes that led to formation of cracks during the annealing of glass.

### **Identification of Transcription Factor Binding Sites**

*Institute of Mathematical Sciences, Taramani*

2013/05/01 - 2013/08/01

Advisor: Dr. Rahul Siddharthan

A Biophysical model of RNA-TF interaction was developed based on the Free-Energy of binding. The free-parameters of the model were estimated analytically using a Supervised Machine-Learning algorithm and training data. The model's accuracy was quantified against test-data to yield good results.

### **Stochastic Processes in Biological Systems**

*Institute of Mathematical Sciences, Taramani*

2012/09/01 - 2012/12/01

Advisor: Dr. Ronjoy Adhikari

An independant reading project to study the application of Statistical Physics in Biological systems. Algorithms for numerical computation of partial differential equations were implemented in Maple.

### **Development of corrosion in Ferretic Samples**

*Indira Gandhi Center for Atomic Research, Kalpakam*

2012/05/01 - 2012/07/01

Advisor: Dr. Shamima Hussain

An experimental investigation was conducted using Scanning Eletron Microscopy to study the progression of oxidation in Ferretic Samples. Python scripts were written to analyze the experimental data and quantify the rate of corrosion in relation to environmental factors of humidity and salinity as well as intrinsic chemical composition of the Ferritic samples.

### **Website**

<https://github.com/nav-mohan>

### **Volunteer Work**

**Western Conference in Science Education 2017** (Conference Co-Organizer)

**Pudiyador India** (Science Activities Organizer)

2015/04/01 - 2016/08/01