Sriram Gopalakrishnan

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EDUCATION

- **University of Waterloo** — Waterloo, Canada
  Physics Ph.D. (Quantum Information) — September 2020 - present
- **IIT Madras** — Chennai, India
  B.Tech. in Engineering Physics — Aug 2016 - May 2020

PROJECTS

- **Constrained Optimization in CVX** — Jan - Apr 2019
  EE5121: Convex Optimization
  - Used the CVX module in MATLAB to solve three practically relevant optimization problems:
    * Recovering a Piecewise Constant signal from a noisy measurement
    * Resource limited revenue maximization
    * Low-rank matrix completion
- **The Tent Map** — Jan - Apr 2019
  PH5500: Dynamical Systems
  - Surveyed literature on the application of chaotic tent maps in image encryption
  - Studied the periodicity and chaos of the 1D Tent Map in Mathematica
- **Quantum capacity of channels with small environment** — Jan - Apr 2019
  PH5842: Advanced Topics in QCQI
  - Surveyed literature on the Quantum Capacity of extremal qubit channels
  - Studied the regime in which simple closed form expressions for the Quantum Capacity can be obtained

PAST EMPLOYMENT

- **IIT Madras** — Chennai, India
  Thesis: Vector 3D FEM for electromagnetic scattering [pdf] — Aug 2019 - Present
  Advisor: Dr. U Khankhoje — Electromagnetics Group
  - Modeled and developed a vector finite element method for electromagnetic scattering in C++
  - The software will be used further research on inverse scattering problems
- **Tata Institute of Fundamental Research (TIFR)** — Mumbai, India
  Superconducting Qubits — May - Jun 2019
  Advisor: Dr. R Vijay — QuMaC Lab
  - Optimized the design of a novel circular bus cavity for maximal inter-qubit coupling
  - Studied the theories of Circuit QED and Microwave Engineering
  - Awarded *Best Project* in Condensed Matter Physics [slides]
- **Homi Bhabha Center for Science Education** — Mumbai, India
  Quantum Dots and quantum many-body theory — Dec 2018 - Dec 2019
  Advisor: Dr. P Pathak
  - Examined the effect of a modified boundary condition on the energy levels of a semiconducting QD
  - Studied variational approaches to solving many-electron systems, including Hartree-Fock and DFT

PUBLICATIONS

- **Landau Quantization of a circular Quantum Dot using the BenDaniel-Duke boundary condition**
  Sriram Gopalakrishnan, Sayak Biswas, Shivam Handa
  Superlattices and Microstructures (2020) [pdf] [DOI]

SKILLS

- **Programming Languages**: C++, Python
- **Scientific Packages**: MATLAB, Mathematica, LaTeX, COMSOL

COURSEWORK

- **Physics (undergrad)**: Classical Mechanics, Electrodynamics, Statistical Physics, Quantum Mechanics
- **Physics (grad)**: Quantum Information, Dynamical Systems, Stochastic Processes, Advanced Stat Mech
- **Mathematics**: Multi-variable Calculus, Probability, Convex Optimization
- **Electrical Engineering**: Signal Processing, Circuit theory, Analog Systems, Communication Systems

HONORS AND AWARDS

- VSRP Scholar, Tata Institute of Fundamental Research 2019
- NIUS Scholar, Homi Bhabha Center for Science Education 2018
- Provisional KVPY Fellow, DST, Government of India (*Rank: 291 of 50,000+ participants*) 2016

UNIVERSITY AND COMMUNITY SERVICE

- **Department Legislator, Engineering Physics** Feb 2019 - Present
  - Organized an session to list a plethora of research internship opportunities relevant to the department
  - Member of the Student Legislative Council (SLC), addressing issues of general interest at IIT Madras
- **National Service Scheme, IIT Madras** Aug 2016 - Apr 2017
  - Taught mathematics to middle and high school students at Suyam Charitable Trust, Vyasarpadi
  - Participated in multiple collection drives within the IIT Madras campus