Dhruv Srinivasan

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EDUCATION

B.S. Physics and B.S. Mechanical Engineering (Dual Degree)　　　　Expected May 2025
University of Maryland, College Park　　　　GPA: 3.93/4.00
- Honors College: Design Cultures and Creativity, Undergraduate Quantum Association

SKILLS

Software: Qiskit & Pennylane (Quantum Computing), Python, Java, Arduino C, MATLAB, pyTorch, Git, Linux
Design: Solidworks, Autodesk Inventor, EAGLE (PCB Design), Fusion 360, 3D Printing (FDM, SLA), Optics

TECHNICAL EXPERIENCE

IBM Research –Quantum　　　　Yorktown Heights, NY
Quantum Hardware Engineering Intern　　　　May 2023 – August 2023
- Developed, tested, and implemented calibration of TWPAs (Travelling Wave Parametric Amplifiers)
  - Calibration independent of readout quality, allowing for initial TWPA settings to be calibrated early during the bring-up process of quantum systems
- Created automated method using *numerical* PID tuning to control Coolant Distribution Units (CDUs)
  - Regulates temperature of Room Temperature Electronics on secondary side of CDU, independent of uncertainties (primary side flow rate and coolant temperature)
  - Faster and more accurate tuning allows for more efficient and quicker bring-up of quantum systems as systems become larger
  - Analyzed correlations between CDU and RF Card temperature variance
- Served on Quantum Intern Advisory Board, a team of 9 that created and organized professional and social events for ~150 Interns: Activities included IBMer panel talks, speed networking sessions, and a fireside chat

Fearless Optics, Quantum Engineering and Technology Laboratory　　　　College Park, MD
Undergraduate Researcher　　　　September 2022 – Present
- Employing Pennylane for unitary preserving and state vector optimization on a parametrized ansatz
  - Author and presenter for paper submitted to IEEE 2023 International Conference on Quantum Computing and Engineering (QCE)
    - D. Srinivasan et. al, "Quantum Circuit Optimization through Iteratively Pre-Conditioned Gradient Descent" in IEEE QCE 2023
- Active optical cavity stability for dual ring resonators for experimental project in analog Hamiltonian simulation of high dimensional phenomena
  - Built and collected results for single resonator lock, simulating and preparing for dual resonator lock
  - Designed with EAGLE and assembled PCB for RF signal attenuation, addition, and multiplication

Underwriters Laboratories Fire Safety Research Institute　　　　Columbia, MD
Engineering Intern　　　　June 2022 – August 2022
- Analyzed experimental data (STA and TGA) using Python and Pandas [here](#)
- Tripled sampling rate and accuracy of window breakage metrics using Python and Arduino Hardware
- Used I2C and SPI protocols with Autodesk EAGLE to design a custom, low wattage hygrometer
- Developed custom PCBs to measure firefighter heat exposure wirelessly during rescues, interfacing with Arduino Yun
- Machine and wire Data Acquisition Racks for large-scale fire tests with National Instruments Hardware
- Write technical reports with LaTex, working collaboratively with GitHub and Git CLI

Maryland Robotics Center Autonomous Micro Air Vehicle Team   College Park, MD
Lead DBVF Design Team Engineer   September 2021 – Present
- Responsible for a team of 10 in the development and manufacturing of a 15lb, 6ft diameter tailsitter drone capable of flying up to 150ft/s; placed 2nd in the VFS DBVF 2022 Challenge [here](#)
- Ensure components are optimized and structurally sound using FEA and CBD
- Model drone in Solidworks with technical drawings and CAM for manufacturing and design reports
- Assign sub-team member responsibilities, coordinating timelines with Analysis and Software teams
- Program MATLAB models for drone speed and current consumption to generate motor, battery, and electronic specification sheets

Terrapin Works Design Team   College Park, MD
Lab Manager, Rapid Prototyping Lab   January 2022 – May 2023
- Interact with clients to determine their design needs, project scope, and timeline
- Design and prototype an electromechanical cell for NIST capable of firing neutrons at a substrate
- Employ additive (FDM, SLA), and subtractive manufacturing (CNC, Laser Cutter) techniques to process client orders and prototype project components
- Slice 3D Printer orders using PreForm (FormLabs), Cura, PrusaSlicer, Markeforge
- 3D Scan and model objects using ROMEO Absolute Arm and Artec LEO

FIRST Robotics Competition Team 1727   Timonium, MD
Team Vice President   September 2017 – May 2021
- Designed each year's 28" X 38" X 60" robot and assigned 25 members to develop each subsystem
- Computer modeled, prototyped, and fabricated components using 3D Printing, CNC Machinery and Laser
- Raised $13,000 annually through sponsorship letters and corporate presentations to operate the club

LEADERSHIP EXPERIENCE

Undergraduate Quantum Association @ UMD   College Park, MD
Director of Events   January 2022 – Present
- Responsible for hosting quantum technology events, weekly events team meetings, and timelines
- Organized the quantum track for the Bitcamp Hackathon, the largest collegiate hackathon on the East Coast
- Lead quantum technology workshops for 40+ students with Startup Shell, Technica, and IBM Fall Fest
- Coordinate with Media and Treasury directors on advertising and funding events

UMD Department of Physics   College Park, MD
Outreach, Student Coordinator   September 2022 – Present
- Conduct multimedia acquisition for an 80+ tour of the University of Maryland Physics Department
- Instruct educational demos for elementary, middle, and high school visits
- Develop workshops to conduct in the Physics Vortex Makerspace

Ridgely STEM Summer Camp   Timonium, MD
Lead Instructor   July 2018 – July 2022 (Summer)
- Created a comprehensive Introduction to 2D Game Design and Introduction to Aerospace Curriculum
- Taught these courses to 14 middle school aged students, along with 3D Printing and Intro Robotics
- Created video resources, educational maker kits and lesson plans for other camps to implement
- Collaborated with instructors on teaching strategy, class scheduling, and hybrid learning activities

Cromwell Valley Elementary Robotics Team   Towson, MD
Lead Mentor   September 2018 – May 2021
- Guided students through the Design Process and building fundamentals through the VexIQ platform
- Introduced and taught programming fundamentals through game design activities in Java
- Developed project-based activities and lesson plans for students to learn these concepts
- Progressed student interpersonal skills by preparing them for interviews and presentations at showcases

RELEVANT COURSEWORK

Mathematics

- Introduction to Partial Differential Equations
- Ordinary Differential Equations
- Linear Algebra
- Multivariable Calculus, Calculus 2, Calculus 1
- Complex Analysis, Fourier Transforms and Series

Physics

- Quantum Mechanics 1 and 2
- Statistical Thermodynamics
- Fields, Waves, Electricity & Magnetism
- Classical Mechanics

Mechanical Engineering

- Vibration, Controls, and Optimization (Fall 2023)
- Fluid Mechanics (Spring 2024
- Electronics and Instrumentation: Analog and Digital (Fall 2023 and Spring 2024)
- Statistical Methods for Product and Process Development (Fall 2023)
- Thermodynamics
- Undergraduate Mechanics and Dynamics
- Computer Aided Design (ENME 272)
- MATLAB
- Object Oriented Programming 1