Shuhul Mujoo, San Jose CA, 408 886 0958, smujoo@caltech.edu

Dear Recruiting Manager,

My name is Shuhul Mujoo, and I'm writing to express my interest in a summer internship at Atom Computing. As an undergraduate at Caltech majoring in applied physics, I would love this chance to work to advance the field of quantum computing. I am available in the summer from June to August in person, full time. I am also willing to do an unpaid internship.

I am extremely passionate about working at Atom Computing. Ever since I learned about quantum computing, I have become invested in a strong belief that quantum computers are a key step towards the future. Reading about Atom Computing on the website fascinated me, from using atomic arrays of optically-trapped neutral atoms, to mid-circuit measurement. Having worked with quantum error correction codes, and algorithms like Grover's and Shor's, I know how important quantum coherent devices are. I have even published a paper on a fault tolerant Quantum Communication algorithm I developed built on the quantum teleportation of a CNOT gate. Moreover, I am enthusiastic about the potential applications to advanced quantum algorithms (Q-KNN and quantum neural networks). At Caltech, I have taken relevant courses: semiconductor devices (lithography, atomic force microscopy, etc.) and photonics (polarization, interference, lasers, etc.).

I am interested in both quantum hardware and software. I have strong research, mechanical, electrical, and software engineering skills, as well as extensive experience with quantum computation.

I have knowledge of Quantum Computing Concepts at a fundamental level, having published a paper on quantum algorithms. I am proficient in coding in both Python and Java. I have the ability to design and develop quantum hardware components. I have a strong understanding of quantum algorithms (Grovers, Shor's algorithm, etc.), and have extensive experience with Q# and qiskit. I have written a paper on Quantum K Nearest Neighbors. I developed implementations of Novel Enhanced Quantum Representation (NEQR) and Quantum Teleportation (QT) algorithms. After being challenged by the unavailability of Quantum RAM while creating an implementation of quantum computing subroutine (Amplitude Estimation), one of my life goals is to help invent and develop Quantum RAM.

Another one of my experiences is an internship at the Search For Extraterrestrial Intelligence (SETI) Institute. I completed a research project and a final presentation on Gas Temperature Prediction For Accretion Disks. I coded simulations using Fortran and Python, and worked with Mathematica. I went through the entire machine learning workflow, from cleaning (exponent overflows), to training (64 neuron 3 layer RELU) architecture, to testing (3d input space plots and precision recall curves).

Additionally, I wrote a research paper (https://arxiv.org/abs/2209.08608) on Simultaneous Localization and Mapping (SLAM), specifically a novel loop closure detection detection system that integrates geometric and human salient features. Building off the state of the art system, ORB-SLAM, I was able to improve the algorithm in organic environments where there were few features. I then tested my localization algorithm on a robot that I built for a robotics competition. With the improved accuracy, my robotics team won first place in California and became a world finalist.

Please let me know if there are any opportunities available. I am extremely passionate about working at Atom Computing!

Sincerely, Shuhul