Masrur Chowdhury

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PROFESSIONAL EXPERIENCE

RTX: Collins Aerospace — Optronics & Advanced Technologies Carlsbad, CA / Vergennes, VT
Systems Engineer June 2023 – June 2025

- Researched the effects of time, temperature, and humidity on the bond strength of primer with RTV silicone, lenses, and optical housings to evaluate long-term adhesion durability.
- Designed and implemented an optical encoder integrating infrared sensors, Quadrature Amplitude Modulation (QAM), and microcontroller systems for precision optics applications, supporting RTV bond pad inspection and measurement. Reduced inspection by 4x and saved $10,000 per unit.
- Developed compliance matrices and conducted 12 engineering audits to ensure adherence to system requirements and AS9100 quality standards.
- Performed optical and vibration testing (including MTF, LSF, and structural stability analysis) to evaluate system performance.
- Contributed to optoelectronic instruments for NASA's Dragonfly mission, tooling and fixture designs in SolidWorks and ZEMAX.
- Conducted Final Acceptance Test Procedures for Head-Mounted Displays (HMDs) to verify compliance with performance benchmarks.
- Authored a competitive analysis report on advanced sensing technologies and competitor capabilities.
- Developed a remote embedded systems program to test advanced hydrogen sensing technology for future aircraft. Automated validation via Python and pyserial.
- Optimized fiber splicing of dissimilar fiber for new aircraft sensing technologies.
- Developed data collection methods in cryogenic environments to test over 100 liquid hydrogen sensor samples across several months, generating large-scale datasets for analysis.

Goodsell Lab: Experimental Scheme for Highly Excited Cold Atoms Middlebury, Vermont
Research Assistant September 2023 - January 2024

- Senior Research Project Supplement (SRPS) grant recipient of $5000.
- Developed a system for laser cooling rubidium atoms to observe their quantum behaviors.
- Implemented fiber optics technology for fine-tuned laser control.
- Researched and documented how cold rubidium atoms exhibit enhanced quantum behavior.

Gliklab: Astrophysics Lab Middlebury, Vermont
Research Assistant June 2021 – August 2022

- Recorded data from 147 quasars using Hubble, GALEX, and WISE space telescopes; With Python and TOPCAT, analyzed star formation patterns; Presented findings at the Keck Northeast Astronomy Consortium REU, Wellesley College, MA.
- Created spectral energy distribution (SED) graphs to investigate properties of Type 1, Type 2, and red quasars.
- Contributed to a paper by Dr.Eilat Glikman in progress on quasar classification and star formation correlations by preparing data visualizations and comparative analysis.

TEACHING AND MENTORSHIP

Teaching Assistant Middlebury, Vermont
Middlebury Physics Department February 2023 – May 2023

- Conducted biweekly TA sessions, assisting students with homework and exam preparation in Newtonian Physics.
- Graded assignments and exams in providing timely and constructive feedback.
- Led study sessions that emphasized critical thinking and problem-solving in physics concepts.
- Led astronomy outreach telescope sessions, teaching students to track celestial bodies and explore the night sky.

SAT Math Tutor Remote
Independent Mentor September 2021 – March 2022

- Tutored students for SAT Math, focusing on problem-solving skills.
- Guided students to achieve scores of 1300+ on the SAT, demonstrating significant performance improvement.
- Developed personalized study plans and practice tests to target individual student learning styles effectively.
- Utilized engaging teaching methods to maintain student interest and motivation throughout the preparation period.

SKILLS

Programming & Scripting: Python, C++, Java, MATLAB, Arduino, SQL, LaTeX, Excel VBA
Data Analysis & Visualization: Jupyter Notebook, Tableau, TOPCAT, Excel, R, Python (NumPy, pandas, SciPy, matplotlib)
CAD & Simulation Tools: SolidWorks, Onshape, Creo, ANSYS (FEA), ZEMAX (optics), Wolfram Mathematica
Hardware: Oscilloscopes, VNAs, multimeters, power meters, DAQ systems, fusion splicing, sensor calibration, cryogenics.
Fabrication: CNC machining, manual machining, 3D printing, soldering, welding, electrical assembly, Dremel & basic machinist techniques
Systems & Process: AS9100 standards, MBSE, FATP development, configuration management, root cause analysis, FRC robotics programming
Embedded Systems & Controls: Sensor integration (IR, force, QAM), embedded programming, signal conditioning, test automation
Languages: English (fluent), Bengali (conversant)

EDUCATION

University of California, Los Angeles (UCLA): Systems Engineering. Professional Coursework

- **Completed**: Introduction to Systems Engineering, Model-Based Systems Engineering (MBSE), and Requirements, ConOps, and Systems Engineering Management, Systems Architecture, Design, and Integration.
- **Enrolled**: Radar and Antenna Systems Fundamentals.

Middlebury College: Bachelor of Arts in Physics. Full-Tuition Merit Scholarship Recipient GPA: 3.5

- **Physics**: Analytical Mechanics, Experimental Physics, Intermediate Electromagnetism, Relativity And Quantum Physics, Physics-based Multivariable Calculus, Electronics For Scientists, Quantum Physics, Astrophysics, Computational Physics.
- **Math**: Calculus III, Linear Algebra, Math Foundations (CS and Math).
- **Computer Science**: Algorithms and Complexity, Data Structures, Computer Architecture.