Afham Bashir

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LinkedIn | GitHub |

EDUCATION

Columbia University New York, NY
B.A in Astrophysics

Relevant Coursework: Data Structures & Algorithms, Astrodynamics and Numerical Methods, Monte Carlo Methods, RK4, LeapFrog, EOS PDEs, Machine Learning Training, K-means, N-body Simulations, χ^2 Analysis, CUDA/OpenCL.

Languages: C++, Python, Java, Assembly, R
Back-End: Node,Express,RestApi, Authentication and Authorization, sessions, NonSQL, PostgreSQL
Front-End: HTML, CSS, JavaScript, bootstrap, Ajax, Json,
Skills: Excel Analysis Toolpak & Power Query, Jupyter, Git, Neural Networks (Particle detectors)

TECHNICAL PROJECTS

APEX (**A**ctive **P**icomotor optical **E**nhancement for fle**X**ure) - Github | Poster

- Designed and Implemented a lucky imaging-based star tracking algorithm to detect and counteract mechanical offsets in the Circumgalactic Hydrogen Alpha Spectrograph detector, caused by shifts in the 2.4m telescope.
- Developed a piezoelectric motor control system to counteract flexure-induced displacements, aimed at achieving corrections at a minimum rate of 4 microns per minute,
- Analyzed telescope slew movement data to track and determine pattern of offsets during observational periods.
- Testing confirmed system performance at 10x the required correction rate, ensuring precision and stability to reduce noise in data and imaging.

EXPERIENCE

Schiminovich Astronomy & Instrumentation Lab New York, NY
Researcher and Developer 05/2024-

- Spearheaded development and documentation of proprietary comprehensive software to build a CHaS Flexure Compensation System.
- Worked with a cross-functional team of researchers and engineers to design, develop, and field-test an advanced optical-mechanical compensation system for the 2.4m telescope at MDM Observatory, Kitt Peak, AZ.
- Achieved a 500% increase in maximum exposure time and doubled spectral resolution through mechanical compensation system.
- Initiated research and development of thermally manipulated optics using ultra-narrow bandpass filters to further enhance spectral resolution and exposure time for the 2.4m telescope.

Columbia University Astronomy Department 09/2024-

- Grader for Professor Mary Putman's Astro1420 & Frederik Paerels Astro2002 Astrophysics 2

SARF, Cofounder & Programmer New York, NY
Programmed for a fintech startup made by Columbia students/alumni 05/2023-09/2024

- Launched desktop based app, coordinating with ui/ux designers for demo app where users can securely register, search for contacts, and make automated p2p/b2b financial transactions between users on the blockchain using crypto (XLM Lumens).
- Won Columbia University Fu Foundation Engineering School NSF startup competition.
- Secured $50K in NSF startup funding to advance blockchain-based financial solutions.

Northampton Community College Learning Center Bethlehem, PA
STEM Tutor 08/2020 - 06/2022

- Tutored students in Calculus (I-III), Physics (I-II), Statics for Engineers, Statistics, RCloud, Business Excel Stats, Organic and General Chemistry, and Discrete Mathematics. Provided code review and debugging support.

National Science Fund Cybersecurity Grant Bethlehem, PA
Peer Mentor 08/2020 - 05/2021

- Mentored computer science students through the online transition during the pandemic, assisting with academic planning, coding resources, and technical guidance.

Liberty Science Center Jersey City, NJ
Intern 08/2016 - 05/2017

- Facilitated interactive educational exhibits, guiding large visitor groups and enhancing engagement through informative demonstrations. Nominated for the Patrice Connelly Memorial Award for outstanding service.