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 Simulations, 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
Front-End: HTML, CSS, JavaScript, bootstrap, Ajax, Json,
Skills: Excel Analysis Toolpak & Power Query, Kubernetes CKO, PostgreSQL, 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.
- Testing confirmed system performance at 10x the required correction rate, ensuring enhanced accuracy and stability.

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.