M.O.B. Jihad

Research Intern, CASSA, Independent University, Bangladesh (IUB)
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EDUCATION

B.Sc. in Computer Science and Engineering Expected: 2027
American International University-Bangladesh (AIUB)

RESEARCH EXPERIENCE

- **Research Intern, CASSA – IUB** Oct 2025 – Jun 2026
  Radio Galaxy Classifier (RGC) group : deep-learning morphological classification of radio AGN from multi-wavelength imagery.
- **RGC I** (In press, Accepted with minor revision, *Astronomy & Astrophysics*)
  Curated and annotated the foundational training catalog, setting the morphological baselines for the primary classifier.
- **RGC II & GAZE Platform** (In Preparation)
  Co-author on a study of cluster-environment effects on radio tail bending. Designed and deployed **GAZE** : a custom MERN/TypeScript dashboard on the lab HPC with a multi-reviewer pipeline, multi-survey viewer (DESI, VLASS, FIRST, LoTSS), WCS axes, and contour overlays. Committed to contributing through model training, fine-tuning, and future work.

ASTRONOMICAL SOFTWARE & TECHNICAL SKILLS

- **Astronomy:** Astropy (FITS, coordinates, WCS), multi-wavelength alignment, custom DS9-style visualization; AstroImageJ and Siril; hands-on with VLA FIRST and LOFAR LoTSS data.
- **Radio Interferometry:** Measurement Sets, EveryBeam (LOFAR beams), SynthMS; working knowledge of the RIME, *uv*-coverage, and primary-beam correction.
- **Software & languages:** Python (advanced), TypeScript/JavaScript, C++, Bash, NumPy, Matplotlib; full-stack web (PostgreSQL, Node/Express, React, WebSockets).
- **Infrastructure:** Linux, HPC clusters, Apptainer/Docker, Nginx, Git, AWS, Cloudflare.

OUTREACH EXPERIENCE

- **Volunteer, Durbin** (CASSA Outreach Programme) Nov 2025 – Present
  Operate telescopes during public observing sessions and author accessible science communication articles including features on deep-sky objects like the Whirlpool Galaxy to promote astronomy education.
- **Coordinator, World Robot Olympiad Bangladesh** 2021 – 2025
  Organized national rounds and delegation selection; delivered hands-on robotics training camps.
- **Section Leader, Stanford Code in Place** 2023, 2025
  Taught two international sections of introductory Python during summer cohorts.
- **Mentor, Bangladesh Open Source Network (BdOSN)** 2021 – 2025
  Travelled extensively across rural and coastal Bangladesh to democratize STEM education. Mentored over 450 national and international students in programming and robotics, and conducted comprehensive training sessions for teachers.
- **Coordinator, Bangladesh AI Olympiad (BdAIO)** 2024
  Spearheaded the national round and team selection process while delivering advanced AI and programming curricula for national and international preparation camps.

SPECIALIZED TRAINING

- **CASSA Workshop 1 — Unclouding the Thousand Eyes of an Array Radio Telescope** May 2025
  Studied radio interferometry from first principles, encompassing the van Cittert–Zernike theorem, complex visibilities, uv-coverage, and RIME. Generated synthetic Measurement Sets using synthms and computed LOFAR Hamaker beams via everybeam on the lab HPC. As a training exercise, generated synthetic Measurement Sets with `synthms` and computed LOFAR Hamaker beams with `everybeam` on the lab HPC.
  Project LoHaZe: Zernike decomposition of the Hamaker beam via the Moore–Penrose pseudo-inverse, reconstructed a 15° station beam to −30/−50 dB residual using the optimal 40 of 200 modes across 110–170 MHz.
- **CCD Image Reduction & Photometry** Sep 2021
  Full CCD reduction (bias/dark/flat) and multi-band (I, R, V) aperture/transit photometry of WASP-12b with AstroImageJ.