ARGHYA CHATTERJEE

🏠 50, BC Das Lane, Lalbagh, Dhaka, BD ✉ arghyame20buet@gmail.com
📶 +88-01943753798 🌐 https://arghyachatterjee.github.io

A machine learning researcher experienced in applying Deep Learning, Edge & Cloud Computing for Computer Vision (CV) related practical applications, Advanced Perception (CV & LIDAR) based SLAM for semantic awareness of the environment and multi-agent collaboration for autonomous robotic exploration to encourage collaborative endeavor in perceptually degraded environments & explore outer space for better future of mankind.

EDUCATION

- **Bangladesh University of Engineering and Technology, Dhaka, Bangladesh**
  Degree: BSc. in Mechanical Engineering   Feb 2015 - Sept 2019
  CGPA: 3.14/4.00

- **Khulna Public College, Khulna, Bangladesh**
  Degree: HSC in Science   Jul 2012 - Aug 2014
  GPA: 5.00/5.00   *Class Position: 1st/60*

- **Khulna Bidyut Kendra Secondary School, Khulna, Bangladesh**
  Degree: SSC in Science   Jan 2010 - May 2012
  GPA: 5.00/5.00   *Class Position: 1st/60*

RESEARCH & PROJECT EXPERIENCE

- **Team Member, Team CoSTAR**
  DARPA organized SubT Challenge for Team CoSTAR of NASA JPL   Jul 2020 – Present
  Perception Team Leader: Dr. Benjamin Morrell (NASA JPL)   *California, USA*
  Topic: Advanced perception based multi-robot SLAM algorithms efficiency, accuracy & robustness testing along with object detection & localization capability analysis for robots like Spot, Husky & Roller-copter with special autonomy setup (built by Team CoSTAR) mounted.

- **Project Supervisor & Educator, Teams from Bangladesh**
  JAXA (& NASA) Kibo-Astrobee ISS Robot Programming Challenge   Jan 2020 – Present
  International Project Coordinator: Mizanul H. Chowdhury (MIT)   *Tokyo, Japan*
  Topic: Autonomously operate Astrobee (A free flying robot) inside ISS avoiding obstacles with 3D perception, following way points and detecting QR & AR Tag.

- **Graduate Research Assistant at Mars Rover Lab, BUET**
  Software Team Advisor (& Ex. Lead) of Interplanetar for URC & ERC   Sep 2019 – Present
  Supervisor: Dr. Md. Ashiqur Rahman (BUET)   *Dhaka, Bangladesh*
  Topic: Autonomous Navigation Based on GPS, SLAM, AR Tag and Object Detection for Safe Exploration of Rovers on Rough Terrains, Caves and Mineral Ores of Earth and Mars.

- **Researcher & Collaborator**
  Undergraduate Thesis   Mar 2018 – Apr 2019
  Supervisors: Dr. Maglub Al Nur (BUET) and Dr. Muhammad Abir (MIT)   *Dhaka, Bangladesh*
  Topic: Computational Investigation on Pool Boiling IR Images for Segmentation of Dry Spots Automatically and Evaluating Performance of Traditional Image Processing and Deep Neural Networks in Quantifying Dry Area Segments.

- **Researcher & Team Leader**
  Undergraduate Project   Mar 2017 - Feb 2018
  Supervisors: Dr. M.A. Rashid Sarkar and Musanna Galib (BUET)   *Dhaka, Bangladesh*
  Topic: Fire and Flood Fighter Octocopter (UAV) for Extinguishing Fire in Fire Affected Buildings and Areas, and Distributing Flood Reliefs to people in Flood Affected Zones.

- **Researcher & Technical Lead**
  Microsoft BD Internship Project   Feb 2017 - May 2017

Supervisors: Sonia B. Kabir and Ashikur Rahman (Microsoft)   *Dhaka, Bangladesh*
Topic: Earlier Screening of Particular Disability in Children Through Mobile Application Using Microsoft Products like Azure Cloud Platform and Bing Maps Server.

- **Researcher & Team Leader**
  Undergraduate Project   Jul 2016 - Feb 2017
  Supervisors: Dr. M.A. Rashid Sarkar and Dr. A. B. M. Alim Al Islam (BUET)   *Dhaka, Bangladesh*
  Topic: Hand Wearable Solar Powered Obstacle Detection and Safe Navigation Device for Blind People in Low Cost.

TEACHING EXPERIENCE

- **JAXA Kibo-Astrobee ISS Robot Programming Challenge**   Jan 2020 - Present
  Instructor for Teams from BUET   *Dhaka, Bangladesh*
- **BUET Mars Rover Robotics Team**   Sep 2019 - Present
  Instructor at Model & Project Lab (Mars Rover Lab), BUET   *Dhaka, Bangladesh*
- **National Space Carnival & Camp**   Sep 2019 - Present
  Instructor & Academic Coordinator for Workshops & Camps   *Dhaka, Bangladesh*
- **Bangladesh Astronomical Society**   Jan 2017 – May 2019
  Instructor for Workshops & Seminars   *Dhaka, Bangladesh*

PROFESSIONAL EXPERIENCE

- **Bangladesh Astronomy Research Collaboration (BARC)**   Feb 2020 – Present
  Advisor & Member   *Dhaka, Bangladesh*
  Activities: Give advice on research activities & how the organization should operate.
- **Youthprenuer Network** (A Social Welfare Organization)   Jun 2019 – Jun 2020
  Head of STEM Education & Development   *Dhaka, Bangladesh*
  Activities: Instructed, Organized and Lead Projects, Workshops, Olympiads and Camps in Educational Institutions to Promote STEM Education in Bangladesh.
- **American Astronomical Society**   Jan 2018 – Present
  Country Coordinator & Member   *Dhaka, Bangladesh*
  Activities: Celebrated International Astronomical Events in Bangladesh in accordance with AAS, and Reported to Proper Authority for Publishing on their Monthly Magazines.

PUBLICATIONS

- Matteo Palieri, Benjamin Morrell, Abhishek Thakur, Kamak Ebadi, Jeremy Nash, **Arghya Chatterjee**, Christoforos Kanellakis, Luca Carlone, Cataldo Guaragnella, Ali-akbar Agha-mohammadi, "LOCUS: A Multi-Sensor Lidar-Centric Solution for High-Precision Odometry and 3D Mapping in Real-Time," IEEE Robotics & Automation Letters Journal, 2020, vol: 6/2, pp. 421-428.
- **A. Chatterjee**, M. Galib and M. A. R. Sarkar, "Application of Arduino in designing modern electromechanical laboratory," 2017 IEEE International Conference on Power, Control, Signals and Instrumentation Engineering (ICPCSI), Chennai, 2017, pp. 222-225.
- **A. Chatterjee**, S. Dutta, P. Sarkar and A. B. M. A. A. Islam, "Obstacle Detector for Blind People with Low Cost (Poster Presentation)," *Proceedings of* 2017 International Conference on Networking, Systems and Security (NSysS), Dhaka, 2017.

INTERNSHIPS & TRAININGS

- **Microsoft Bangladesh**   Feb 2017 - May 2017
  Internship Project: Disabling Disability through Microsoft Products   *Dhaka, Bangladesh*
- **Khulna Power Company Limited**   Oct 2018 – Oct 2018
  Training: Power Plant Visit & Industrial Attachment (3 weeks)   *Khulna, Bangladesh*

SKILL SETS

- **Prg. Language:** Python, C++, C#, C, R, Arduino, Java, Java S, HTML, PHP, CSS, & LATEX.
- **Framework & OS:** ROS, OpenCV, PCL, Nvidia Isaac SDK, Keras, TensorFlow, PyTorch, Caffe, CUDA, OpenGL, Kubernetes, .NET, Django, Linux, Mac, Windows & Android.
- **Software & Tool:** Git & GitHub, Docker, MIPAR, Solidworks, Ansys, PLC, Blender, Unity & UE 4, Verge3D, Carla Simulator, Microsoft Airsim, OpenPose3D, Meshroom, Meshlab, CloudCompare, OpenDroneMap, OpenSpace, Photoshop, Kdenlive & MS Office Family.
- **IDE, Compiler & Text Editor:** CodeBlocks, Microsoft Visual Studio, MATLAB, Atom, Jupiter Notebook, PyCharm, Android Studio, Nodejs, IntelliJ IDEA, VS Code & Notepad++.
- **Cloud Platform:** AWS Compute, AWS RoboMaker & Storage, GCP, Google Colab.
- **Hardware:** GPS (RTK), IMU, VLP-16 (3D) & RPLidar (2D) LIDAR, Intel Realsense D435i RGBD & L515 Lidar Camera, ZED 3D Camera, Nvidia Jetson & Intel NUC Boards, Arduino & Raspberry PI Boards, PX4, Ardupilot, VESC, BLDC motor, Nvidia AMD GTX Boards & Oculus Rift S VR Headset.
- **Technology:** Computer Vision, Image Proc., ML, DL, DRL, Object Detection & Recognition, Image Segmentation, Pose Tracking, SLAM, Photogrammetry, 3D Printing, AR, VR & MR, Game Dev, Web Dev, Video Editing, GPU, Edge & Cloud Computing.
- **Language:** Bangla, English & Hindi.
- **Others:** Astronomy, Creative Arts, Singing, Harmonium & Guitar Playing, Organizing, Show Hosting, Volunteering, Swimming, Cycling, Playing Cricket, Football & Badminton.

AWARDS, HONORS & SCHOLARSHIPS

- **Gold Medalist from Duke of Edinburgh International Foundation** — Dec 2019
  Awarded for Outstanding Extra-curricular & Service to the Society — *London, UK*
- **2nd in Asia & 16th Internationally in European Mars Rover Challenge** — Sep 2019
  European Space Foundation (ESF) & European Space Agency (ESA) — *Kielce, PL*
- **Finalist in IEEE SS12 International Project Competition & Maker Fair** — Jul 2017
  SS12: Age of Innovation and Maker Fair 2017 — *Hyderabad, IN*
- **1st in National Project Show Competition (Senior Category)** — May 2017
  EEE Day, BUET — *Dhaka, BD*
- **3rd in Inter University Project Show Competition** — Apr 2017
  Mechanical Festival, BUET — *Dhaka, BD*
- **1st in National Poster Presentation Competition** — Mar 2017
  Robolution, MIST — *Dhaka, BD*
- **2nd in Inter University Project Show Competition** — Nov 2016
  CSE Day, BUET — *Dhaka, BD*
- **1st in All Classes in Primary, Junior, Secondary & H. Secondary** — 2002-2014
  Elizabeth Primary Sc., Khulna BKS Sc., Khulna Pub. Cl. — *Khulna, BD*
- **Govt. Board Scholarship in Primary, Junior, Secondary & H. Secondary** — 2006-2014
  Education Board of Bangladesh Govt., Jessore — *Khulna, BD*
- **Olympiad Achievements:**
  - *1st in Reg. R. of Science Olympiad'14*
  - *3rd in Reg. & 10th in Nat. R. of Astro-Olympiad'13*
  - *1st in Reg. R. of Zoology Olympiad'14*
  - *3rd in Reg. R. of Math Olympiad'14*

CERTIFICATIONS

- **Machine Learning** by Stanford University on Coursera, Feb 2018.
- **Deep Learning Specialization** (5 course) by Deeplearning.ai on Coursera, Sept 2018.
- **Control of Mobile Robots** by Georgia Institute of Technology on Coursera. May 2020.
- **Image & Video Processing** by Duke University on Coursera, Nov 2018.
- **Intro to Satellite Communications** by Institut Mines – Télécom on Coursera, May 2019.

- **Wireless Communications for Everybody** by Yonsei University on Coursera, Dec 2018.
- **AstroTech** by University of Edinburgh on Coursera, Dec 2019.
- A Course on **Nuclear Power Eng**. by Institute of Nuclear Power Engineering, BUET, Apr 2018.

LEADERSHIPS

- **Head** of STEM Education & Development   *Youthprenuer Network*
- Software **Team Lead**   *Team Interplanetar, BUET*
- **Technical Lead** of Internship Project   *Microsoft BD*
- **President** (Senior Rover Mate)   *BUET Rover Scout Group*
- **President**   *Satyen Bose Science Club, BUET*
- **Team Lead** for Development & Planning   *ESAB, BUET Unit*

VOLUNTEERING

- **Sceptre (Poverty Alleviation Organization)**
  Activities: Org. free medical camps & distribute dress & sewing machines to poor people.
- **BUET Rover Scout Group**
  Activities: Volunteered on alumni day at BUET & org. flood relief distribution camp.
- **Khulna Bidyut Kendra Secondary School Scout Group**
  Activities: Volunteered on medical camps, tree plantation events & sports day at KBKSS.

SEMINARS & WORKSHOPS

- **International Youth Leadership Summit-2016** org. by BYLC.
- 4th BIRDS International Workshop on **Demystifying Satellites** org. by BRAC University.
- Seminar on **Zero Robotics** by M.H. Chowdhury of MIT org. by Dept. of Mech. Eng., BUET.
- Seminar on **Space Stories and ISS Experiences** by Astronaut Dr. Tess Caswell of NASA org. by Dept. of Civil Eng., BUET.
- Seminar on **4-fold Resolution Increase in Endoscopic Imaging** by J.M. Kahn of Stanford University, org. by Dept. of Biomedical Eng., BUET.
- Workshop on **ML, PCB, Graphic Designing, & Technical Paper Writing** org. by IEEE BDS.
- Workshop on **CFD, Ansys Fluent, Solidworks & 3D Printing** org. by Involute Tech BD.

MEMBERSHIPS

- Institute of Electrical and Electronics Eng. **(IEEE)**
- American Nuclear Society (**ANS**)
- Bangladesh Astronomy Research Collaboration
- American Astronomical Society (**AAS**)
- IEEE Robotics and Automation Society
- BYLC Graduate Network **(BGN)**

REFERENCES

- **Dr. Benjamin Morrell**
  Perception Team Leader, Team CoSTAR
  Ex. Post Doc Researcher, Caltech
  Robotics Technologist, NASA JPL .
  Email: benjamin.morrell@jpl.nasa.gov

- **Dr. Muhammad Abir**
  Thesis Co-Supervisor
  Ex. Post Doc. R. Associate, Dept. of NSE, MIT.
  Imaging Specialist, Phoenix Nuclear Labs.
  Email: miabir@mit.edu

- **Dr. Md. Ashiqur Rahman**
  Project Supervisor
  Professor, Dept. of Mech. Eng., BUET.
  Email: ashiqurrahman@me.buet.ac.bd

- **Mizanul H. Chowdhury**
  Project Supervisor
  Arch. & Admin of ZR, Space Systems Lab, MIT.
  Email: mizanul@mit.edu