Aravind Bharathi

Engineering Physics with Honours

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aravindbharathi

Education

Present **B Tech**, *Department of Physics*, *Indian Institute of Technology, Bombay*, *Mumbai, India*.

Research Interests

- General Relativity
- Cosmology
- Mathematical Modelling
- Astrophysics
- Computational Physics
- Numerical Relativity

Publications

Katla V., Valluvan A. B. et al. An Approach to Star Tracker Design for Nano-Satellite Applications extended abstract presented in National Conference on Small Satellite Technology and Applications, Trivandrum, India, 2020

Research Experience

Present **Astrometric Microlensing with GAIA**

Principle Inv. *Professor Vikram Rentala, Department of Physics, IIT Bombay*

- Implementing an end-to-end pipeline to estimate the blips in time-series light data from GAIA for point-like and extended lens targets to detect dark matter subhalos using gravitational lensing

2020 – 2021 **Canopy Height Estimation using drone-based RGB Images**

Principle Inv. *Professor J. Adinarayana, Institute Chair Professor, IIT Bombay*

- Conducted a literature survey on the topic of Computer Vision and understood techniques used in Digital Photogrammetry ranging from Structure from Motion and Multi-View Stereo Algorithms to Poisson 3D Surface Reconstruction Methods
- Implemented an algorithm to estimate the height of agricultural crops from drone-based optical images through the generation of dense point clouds

Technical Projects

Present **IIT Bombay Student Satellite Program** | Avionics Engineer

A 70 member student team dedicated to the vision of making IITB a centre of excellence in space technology

- The Student Satellite Program is a landmark project taken up by IIT Bombay students with an objective to make the institute a respected Centre of Excellence in Satellite and Space Technology in the world
- Having successfully built and flown its first satellite, *Pratham*, the team is currently working on five space-based systems of which I am part of the Star Tracker-based Attitude Determination System

Present **Astronomy Animation Team** | Technical Animator, Co-Founder
Advisor *Dr. Akshat Singhal, Department of Physics, IIT Bombay*

Summer 2021 **Computational Geometry and Algorithms**
Guide *Professor A. Agrawal, Department of Computer Science and Engineering, IIT Madras*

Spring 2021 **Quantum Imaging using Complex Degree of Coherence**
Guide *Professor Anshuman Kumar, Department of Physics, IIT Bombay*

A comprehensive list of all projects can be found here

Institute Positions

Present **Subsystem Head** | Electrical
Student Satellite Program, IIT Bombay

Present **Division Lead** | Astrophysics
Astronomy Animation Team, IIT Bombay

Present **Department Academic Mentor**
Student Mentorship Program, IIT Bombay

Summer 2021 **Panel Member** | Institute Technical Summer Project
Institute Technical Council, IIT Bombay

2020 – 2021 **Institute Technical Convener** | Maths and Physics Club
A self-sustaining community of intellectuals, students and professors, across ages and departments to celebrate the sciences we revere in their purest of forms and all their grandeur

Technical Skills

Programming C++, Python, Matlab, C, VHDL, ROOT
CAD & Sim. Blender, EAGLE, SPICE, Quartus Prime
Dev. Tools Git, Docker, OpenCV, Pillow, GDAL

Courses Taken

List of courses taken can be found here

Extracurriculars

- Active public speaker and science communicator
- Certified with the Level 3 Certificate in Graded Examination in Music Performance, the highest possible, Grade 8 for Piano by the Trinity College of London
- Long-Distance Cyclist and Recreational Triathlete
- Highest typing speed: 112 *words-per-minute*. Average: 98 *words-per-minute*

Complete CV available on request