Amal S Sebastian

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Github Profile

Education

2017–2022 **Ph.D.**
Carnegie Mellon University, Mechanical Engineering.

2017–2022 **Master of Technology and Bachelor of Technology**
Indian Institute of Technology Bombay, Aerospace Engineering, GPA – 9.29/10.
Minor in Computer Science and Engineering

Publications

Published Prabhu Ramachandran, Aditya Bhosale, Kunal Puri, Pawan Negi, Abhinav Muta, A. Dinesh, Dileep Menon, Rahul Govind, Suraj Sanka, **Amal S. Sebastian**, Ananyo Sen, Rohan Kaushik, Anshuman Kumar, Vikas Kurapati, Mrinalgouda Patil, Deep Tavker, Pankaj Pandey, Chandrashekhar Kaushik, Arkopal Dutt, and Arpit Agarwal. 2021. PySPH: A Python-based Framework for Smoothed Particle Hydrodynamics. DOI:`https://doi.org/10.1145/3460773`

Projects

Research Projects

2020 **Simulation of vortex rings, sloshing tanks, dam break using SPH**
Guide: Prof. Prabhu Ramachandran, Dept. of Aerospace Engineering, IIT Bombay.

- Implemented a Gaussian vortex ring simulation using PySPH. Currently working on simulating collision of vortex rings and verifying accuracy of simulations done so far.
- Carried out simulations of rectangular sloshing tanks under horizontal and rotational excitations. Compared computed results with experimental data from literature and close agreement between the two was obtained.
- Carried out simulations of multiple dam break problems with obstacles. Computed results showed good agreement with experimental results.

2019 **PySPH and Mayavi**
Guide: Prof. Prabhu Ramachandran, Dept. of Aerospace Engineering, IIT Bombay.
Worked on improving functionality and adding features to PySPH and Mayavi which are open source Python projects

- Developed code to generate uniform particle distribution and surface particle distribution of a STL object which can used for SPH simulations in PySPH
- Developed code to visualize STL objects along with their normals and allow for inversion of the normals using mouse interaction for Mayavi a 3D scientific data visualization toolkit
- Modified the Picker structure to display coordinate and data information on the scene using VTK's Text widget. Implemented an onscene slider and button widget for Mayavi

2018-Present **Senior Design Engineer**
RAKSHAK, IIT Bombay.
Part of a student tech team which designs and builds UAVs for search and rescue missions

- Part of the aerodynamics subsystem of the team which mainly deals with the design and manufacturing of the UAV
- Primary work pertains to design of the wing, and estimation of performance characteristics
- Represented RAKSHAK at the Indian National Academy of Engineering's Youth Conclave at IIT Delhi under the Lab to Market category and secured first place in it

2018 **Cyclocopter**
Institute Technical Summer Project, IIT Bombay.

- Attempted to create a VTOL device based on cycloidal blade systems. Designed and manufactured major components of the model and carried out tests of the same.

Awards, Scholarships and Achievements

2019 Inducted as a student member of the Indian National Academy of Engineering

2017 Secured All India Rank 1572 in JEE Advanced 2017 among 200,000 students.

2017 All India Rank 834 in the JEE Mains 2017 taken by over 1.2 million students.

2015 Recipient of the prestigious National Talent Search Examination (NTSE) scholarship given by NCERT.

Technical skills

Languages C, C++, Python, Cython

Tools XFLR5, Ansys Fluent, SOLIDWORKS, AutoCAD, Git

Positions of Responsibility

2020-2021 Coordinator - Department Academic Mentorship Program, Department of Aerospace Engineering, IIT Bombay

2019-2021 Department Academic Mentor