⌈Arjit Seth⌉

http://godot-bloggy.tech/

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Education

Hong Kong University of Science and Technology — Clear Water Bay, Hong Kong
Master of Philosophy - Mechanical Engineering (Aerospace); CGGA: 3.5/4.3 — Sep. 2018 – Sep. 2020

Manipal Institute of Technology — Manipal, India
Bachelor of Technology - Aerospace Engineering; CGPA: 7.59/10.00 — Aug. 2014 – May 2018

Symbiosis International School — Pune, India
International Baccalaureate - Diploma Programme; Results: 37/45 — Aug. 2011 – May. 2013

Symbiosis International School — Pune, India
IGCSE, Cambridge; Percentage: 88% (Distinction Awarded) — Aug. 2010 – May. 2011

Experience

OCTAD Lab, Hong Kong University of Science and Technology — Clear Water Bay, Hong Kong
M.Phil Researcher under Professor Rhea LIEM, Ph.D — Sep. 2018 - Sep. 2020

- **Amphibious Aircraft Design Framework**:
  * Developing a conceptual design and sizing framework beyond existing literature.
  * Investigating and optimising aircraft stability, especially within the takeoff regime.
  * Minimising hull drag for takeoffs, possibly with the use of hydrofoils.

Hong Kong University of Science and Technology — Clear Water Bay, Hong Kong
Research Intern under Professor Rhea LIEM, Ph.D — Feb. 2018 - Jun. 2018

- **Investigation of Hydrofoils for Amphibious Aircraft**:
  * Developing code for takeoff analysis of amphibious aircraft in Python.
  * Performing automation of CFD analyses of hydrofoils for amphibious aircraft using ANSYS Fluent and OpenFOAM.
  * Performing aerostructural analyses of wings for amphibious aircraft.

Centre for Avionics, Manipal Academy of Higher Education — Manipal, India
Head of Aircraft Design — Aug. 2016 - Dec. 2017

- **VTOL-Hybrid Aircraft Design**: Responsible for technical design of Micro Air Vehicles (MAVs) to match specific and complex requirements for government-funded projects. Responsibilities:
  * Designing an autonomous, high endurance,long-range radio-controlled quadcopter-airplane hybrid aircraft for vertical flight (VTOL) and forward flight.
  * Developing code in MATLAB to retrieve aircraft performance characteristics from automated radio-controlled flights using autopilots such as Pixhawk. Generating CAD models in CATIA, performing CFD analyses using ANSYS Fluent and structural analyses using ANSYS Mechanical for prototyping.

AeroMIT - Aeromodelling Team, Manipal Institute of Technology — Manipal, India
Head of Aerodynamics — Apr. 2016 - Apr. 2017

- **SAE Aero Design (Micro Class), international competition sponsored by Lockheed Martin**: Development of a small, radio-controlled aircraft with a high payload fraction that fits into a cylinder of 6 inches in diameter. Scoring is based on maximising payload fraction, minimising cylinder length and optimising aircraft endurance.
  Responsibilities:
  * Aircraft Design – Dimensioning and configuration.
  * Optimising aircraft performance parameters such as payload carrying capacity and endurance.
  * Computational fluid dynamics analyses on high-lift airfoils/wings.
  * Optimising flight dynamics and stability by running simulations using MATLAB and Simulink.
  * Developing mathematical models for structural analyses using MATLAB, Python and ANSYS Mechanical.
  * Preparing a technical design report and presentation on the developed aircraft.
  * Teaching aerodynamics, flight dynamics, aircraft design and CFD to juniors of the team.

2018 East Results: Rank 1 in Design and Rank 3 in Technical Presentation.
2017 West Results: Rank 1 in Highest Payload Lifted, Rank 2 in Highest Payload Fraction, Rank 4 Overall.
2016 East Results: Rank 3 in Highest Payload Lifted, Rank 4 in Highest Payload Fraction, Rank 5 in Design and Overall.

- ○ **TATA Protean UAV Challenge 2016-17**: This national competition's aim is to develop a multi-rotor drone that is able to switch between quad, hex and octo configurations while midair with stability.
  - ∗ Developed the mathematical model to ensure stability between configurations using MATLAB and Simulink.
  - ∗ Performed computational structural analyses to ensure rigidity and minimise vibrations.

  Results: Awarded 1st position with prize money.

SOFTWARE EXPERTISE

- **Software**: ANSYS, CATIA, SolidWorks, OpenFOAM, MATLAB, XFLR5
- **Languages**: Python, Haskell, Lua, Bash, C++, LaTeX

PROJECTS

- **Computational Fluid Dynamics**: Personal research into CFD techniques with various applications.

  - ○ Automated CFD routines in Python using various solvers for generation of surrogate models to obtain aerodynamic coefficients for airfoils with varying angles of attack and Reynolds numbers.
  - ○ Automated meshing routines in Python to generate high-quality O-grid and C-grid meshes in 2D and 3D for airfoils and wings using ANSYS ICEM CFD: http://godot-bloggy.tech/post/o-grid-c-grid-comparison/
  - ○ Performed flow analyses over various airfoils, and complex wing geometries with aerodynamic devices such as winglets and flaps, including cavitation studies using ANSYS ICEM CFD, ANSYS Mesh, Fluent and OpenFOAM.
  - ○ Programming CFD codes by using and independently developing Prof. Lorena Barba's '12 Steps to Navier Stokes' CFDPython course as a reference: http://godot-bloggy.tech/post/cfd-python/

- **Dubby Pendy**: A double pendulum simulator programmed in Lua using the LÖVE 2D framework for graphics to analyse phase spaces and develop an understanding of dynamical systems.

- **Bloggy**: A technical blog to post personal project developments and academic discoveries. Research topics include mathematics, physics, aerodynamics, and music. Some notable posts:

  - ○ Calculus of Variations - Induced Drag Over a Wing
  - ○ Academics - Physics and Mathematics
  - ○ Investigation - The Roots of Unity

- **Workshop on XFLR5 and Aerodynamics, IE Aerospace**:

  - ○ Demonstrated the use of XFLR5 in elementary aerodynamic analyses such as airfoil and wing design to freshman engineering students.
  - ○ Taught introductory aerodynamics and introduced computational fluid dynamics as a tool for aerodynamic analysis using ANSYS Fluent.