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**EDUCATION****Hong Kong University of Science and Technology***Master of Philosophy (MPhil) - Mechanical Engineering (Aerospace); CGA: 3.75/4.3*

Clear Water Bay, Hong Kong

*Sep. 2018 – Sep. 2020***Manipal Institute of Technology***Bachelor of Technology (B.Tech.) - Aerospace Engineering; CGPA: 7.59/10.00*

Manipal, Karnataka, India

*Aug. 2014 – May 2018***Symbiosis International School***International Baccalaureate - Diploma Programme; Results: 37/45*

Pune, Maharashtra, India

*Aug. 2011 – May. 2013*

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**PUBLICATIONS**

- [1] Madhusudanan, Vinay, **Seth, Arjit**, and G. Sudhakara. **2019**. “Descending Endomorphisms of Groups”. In: *4th Alterman Conference-cum-Workshop on Computational & Geometric Algebra, and Workshop on Kähler Calculus*.
- [2] **Seth, Arjit** and Liem, Rhea. **2019**. “Hydrofoil Conceptual Design and Optimization Framework for Amphibious Aircraft”. In: *AIAA Aviation 2019 Forum*, p. 3552.
- [3] **Seth, Arjit** and Liem, Rhea. **2018**. “Takeoff analysis of amphibious aircraft with implementation of a hydrofoil”. In: *Structures18 - The 2018 Structures Congress*. Incheon, Korea.

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**SOFTWARE AND PROGRAMMING KNOWLEDGE****Software:** OpenFOAM, MATLAB, ANSYS, CATIA, SolidWorks, XFOIL, OpenMDAO, DAFOAM**Languages:** C++, Fortran, Python, Julia, Haskell, Lua, Bash,  $\LaTeX$ 

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**EXPERIENCE****OCTAD Lab, Hong Kong University of Science and Technology***M.Phil Candidate Researcher under Professor Rhea LIEM, Ph.D*

Clear Water Bay, Hong Kong

*Sep. 2018 - Sep. 2020***Amphibious Aircraft Design Framework:**

- Developing a conceptual design and sizing framework for amphibious aircraft using OpenMDAO.
- Investigating and optimising aircraft stability in the water-takeoff regime.
- Minimising hull drag during water-takeoffs with the use of hydrofoils via CFD analyses in OpenFOAM.

Studentship of HKD 410,000 awarded for the programme.

**Hong Kong University of Science and Technology***Visiting Research Intern under Professor Rhea LIEM, Ph.D*

Clear Water Bay, Hong Kong

*Feb. 2018 - Jun. 2018***Investigation of Hydrofoils for Amphibious Aircraft:**

- Developed code for water-takeoff analysis in Python.
- Automated meshing and CFD analyses of airfoils and hydrofoils in ANSYS using Python.
- Performed aerostructural analyses of a wing for an amphibious aircraft.

**Centre for Avionics, Manipal Academy of Higher Education***Intern - Aircraft Design Lead*

Manipal, India

*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:

- Designed and manufactured an autonomous, high-endurance, long-range radio-controlled multirotor fixed-wing hybrid aircraft for vertical (VTOL) and cruise flight.
- Developed code in MATLAB to retrieve aircraft performance characteristics from automated radio-controlled flights using autopilots such as Pixhawk.
- Generated CAD models in CATIA and performed CFD analyses using ANSYS Fluent and structural analyses using ANSYS Mechanical for prototyping.

**SAE Aero Design (Micro Class), international competition sponsored by Lockheed Martin:** Development of a radio-controlled aircraft that fits into a cylinder of 6 inches in diameter. Scoring is based on maximising payload fraction in flight, minimising cylinder length, and a technical report and presentation.

*Responsibilities:*

- Preparing a technical design report and presentation on the developed aircraft.
- Aircraft Design – Weight estimation, sizing, configuration, performance, payload optimisation.
- Computational fluid dynamics analyses on high-lift airfoils/wings.
- 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 Overall.

**TATA Protean UAV Challenge 2016-17:** This national competition's aim is to develop a multi-rotor drone 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.

## PROJECTS

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**Aircraft Design Optimisation:** Investigations into aerodynamic shape optimisation.

- Performed multipoint gradient-based aerodynamic shape optimisation of a low-speed UAV wing via the discrete adjoint approach using the [MACH: MDO of Aircraft Configurations with High fidelity framework](#) developed by the MDO Lab at the University of Michigan.

**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/>
- Implementation of the constant-strength doublet-source panel method for potential flows over airfoils in Julia.

**Dubby Pendency:** 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.