
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.) - Aeronautical 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

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: *ALAA 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.

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

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.
- Analysing hull drag during water-takeoffs with the use of hydrofoils, by generating surrogate models for hydrofoils via multiphase CFD analyses in OpenFOAM with High-Performance Computing resources.

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 fluid-structure interaction analyses of a wing for an amphibious aircraft.

Centre for Avionics, Manipal Academy of Higher Education*Research and Development 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

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, C++ , Fortran, Python, and Haskell for benchmarking tests.

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.

REFERENCES

Arjit Seth

Dr. Rhea Liem

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Role: Principal Research Advisor and Professor of MECH 3620 (L1) – Aircraft Design

Dr. Larry Li

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Role: Professor of MECH 5960 (L1) – Flow Instability

Dr. Ivan Chi-Ho Ip

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Role: Professor of MATH 5111 (L1) – Advanced Algebra I