MRIDUL AGGARWAL

MSc Aerospace Computational Engineering

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PERSONAL STATEMENT

Focused on using computational engineering software to analyze and solve engineering problems using advanced computational methods specifically for the aerospace industry. Stronghold in developing modelling simulations using different commercial software and tools. Hands-on experience in distributed scientific computation creating simulation models for various engineering applications. Strong team player having worked with global teams on different projects related to engineering and project management.

KEY SKILLS & HIGHILIGHT

Computational Engineering: High Performance Computing, Computer Aided Engineering & Design, Finite Element / Volume Analysis

Engineering Software: MATLAB Simulink, ParaView, Tecplot, Abaqus, Solidworks, ANSYS Workbench, Fluent, SpaceClaim, CFD-Post, CES Edu Pack

Programming languages: C++, C, LINUX.

Language: English (Professional), Hindi (Native), Sanskrit (Beginner)

KEY ACHIEVEMENTS

- Appreciation Certificate for work on TEDx PSB Academy, Singapore in 2018 had an audience of 500
- Award of excellence by Indian Development Foundation in Resource Mobilization for Humanitarian Causes arranged for helping 1000+ people suffering from cancer
- NASA Space School Certification for being part of the team to work on rover functioning and demo rocket launching during the stay at NASA in the USA
- Indian National Cadet Crop Air Wing 'A' Certification for qualifying 2 national camps with excellence

EDUCATION

MSc: Aerospace Computational Engineering, Cranfield University, Cranfield, UK (September 2021 – August 2022)

- **Modules:** Computational Methods & Engineering Structures, Numerical Modelling for Compressible Flows / Incompressible Flows, Analysis & Visualization of Big Data System & High-Performance Computing, Modelling Approaches / Validation & Verification for Aerospace Application.

- **Group Project:** Led a team of 5 to work on "Aircraft Simulation" focusing on the simulation of the Jetstream 31 full aircraft and/or a model aircraft simulation to gain transient data using different Unsteady Reynolds-Averaged Navier-Stokes (URANS) and Detached Eddy Simulation modelling approaches. This resulted in the successful completion of the project by bringing errors close to 5% as compared with experimental data. In addition to this, the results achieved by the group were better than from the past research which was done using the same aircraft model.

- **Individual Research Project:** Numerical Investigation of the Airflow Ventilation system in the Interior of an Aircraft Cabin in Presence of an Infected Passenger has been done under the guidance of Dr László Könözsy for my research project and completed successful placing a modified displacement ventilation system for the aircraft cabin and tracking the virus particle movement inside the aircraft cabin using the Boeing 767 aircraft model. Moreover, documented the effects of different unstructured mesh with increasing mesh density on the aircraft cabin flow. Additionally, used poly hexacore hybrid mesh based on Mosaic technology for generating mesh and reported its consequences on the aircraft cabin model with that I become the first one to use poly-hexacore mesh on the aircraft cabin model for flow analysis. Learned the use of parallel computing by using High Performance Computing for my research project.

- **Score:** Maintained the average of 77.4% with highly likely achieving Distinction in Masters.

Bachelors of Engineering (Honours) (Mechanical): The University of Newcastle, Australia (Singapore Campus) (August 2017 - May 2020)

- **Modules**: C Programming, Engineering Mechanics/Computations, Thermofluids, Computer-Aided Engineering & Manufacturing, Mechatronic Systems, Transport Phenomena, Thermodynamics, Automatic Control, Engineering Economic Analysis.

- **Group Project: 1.** Led a team of 4 to develop a prototype based on collecting & placing goods for " WARMAN Competition". Coded the Arduino-based robot for collecting items from a certain height and then follow the assigned path and finally drop the goods at their final destination. Being the leader of the group, I opted to work on the collecting and dropping mechanisms whereas the other mates were assigned a different task to enable the robot to make a move around the path assigned for taking goods from one place to another.

  2. Collaborated with 4 other university students to develop a mobility system for setting up a bicycle sharing system for university students. Cost and quality management was my sole responsibility in the group. This idea was suggested by myself to help students to cut down their travelling cost and time during their stay at university.

  Individual Research: 1. Worked on "Simulation of Air Distribution in an Office room Ventilation by an Air-Conditioner" to decrease energy consumption by the ventilation system and increase the oxygen level inside the office room. Designed the office room using ANSYS Workbench and then a pressure-based solver implemented with a SIMPLE algorithm to model the airflow and thermal comfort of the people inside the office room.

  2. Prepared report on "Aerodynamics of Wing with or without Winglet" to document effects of winglet (aerodynamics characteristics) using airfoil NACA 6409 in CFD.

- **Score:** Attained 2:1 grade in bachelor

CAREER HISTORY

RACL GEARTECH LTD: Gajraula, Uttar Pradesh - Internship (January 2021 - April 2021)

RACL Geartech combines advanced production technology with precision engineering to present an unrivalled array of Transmission Gears & Shafts, Reduction Gears, Gear Boxes, etc. Created a strong base across the world and has a long list of satisfied clients in countries like Japan, Germany, Italy and many more which includes prominent companies like KTM, BMW, ZF, and TATA motors.

- Allocated as a Production process quality engineer to overlook process quality for gear manufacturing on daily basics and to solve issues faced by the machine operator
- Supervised effectiveness of patrol inspection and 4M change of 50 machines daily and actions to document

- Conducted 60 Internal Process Audits as well as a Process Capability Study to analyze machines' efficiency for better manufacturing productivity
- Prepared root causes analysis for 5 gear process on gear rejections resulted in a decrease in rejections in a 2-month time
- Co-ordinated with project head in the installation of new gear manufacturing machines

SKILLS, INTERESTS & EXTRACURRICULAR ACTIVITIES

- **Membership:** CRANSEDS & Engineers Australia

- **Sports:** Table Tennis played from Junior School (2009-2019), Swimming, Cricket, Lawn Tennis

- **Leadership: 1.** Served as a member of the Prefectorial Body and lead 200+ students of Birla Public School Pilani, Rajasthan, India in 2017.

  2. Headed the logistics team of SASA (South Asian Student Association) based in PSB Academy, Singapore organizing different cultural activities and South Asian festivals.

- **Volunteered**: For Nationwide Cancer Control Program and food distribution in various rag pickers camps organized by the Government of India.