RISHI VIGNAN VELPULA

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CAREER SUMMARY

Curious and motivated individual having first hands experience with in aerospace industry and technologies, with educational background in electrical & electronics engineering and aerospace engineering. Passionate about clean technology solutions, with a strong focus and belief in the transformative potential of aircraft electrification.

WORK EXPERIENCE

Rolls-Royce Deutschland **Berlin, Munich**
(Engineering & Technology Graduate engineer) Nov 2022 - present

- Support the test team in the activities such as commissioning test setup, instrumentation work, test reports, documentation and lessons learnt and developed MATLAB scripts for dedicated test cases to enhance post-processing and visualization of data, and to maximize script automation by more than 80% to analyze large data sets and reducing user interactions.
- Built various market models to achieve a consensus view, utilizing the market segmentation conducted for both the 9 and 19 PAX categories. The results derived, among others from these models forecast a total market share of 79% in the 9 PAX segment and 100% in the 19 PAX segment for the top 5 OEMs.
- Managed a technical project focused on urban air mobility, achieving a 30% weight reduction and 20% cost savings on a physically tested prototype.
- Contributed to various business domains, identifying design changes for fuel cell applications in aerospace and automotive sectors, business case for enhancing ALM capabilities, and developing group-level technology strategy and road mapping. Developed a comprehensive systems diagram for the fuel cell system, which included meticulous detailing of the components within each of the 5 sub systems, by specifying the boundaries and interfaces between each sub system, ensuring a cohesive and functional design.

DLR - Deutsches Zentrum für Luft und Raumfahrt, **Cottbus**
Institute of Electrified aviation engines
(Student Job) May 2022 - Sep 2022

- Design and optimization of compact heat exchanger for the thermal management system of the fuel cell power train for aircraft with an output of around 1.5 MW for electrified aircraft propulsion applications.

DLR - Deutsches Zentrum für Luft und Raumfahrt & **Cottbus**
Brandenburgische Technische Universität
(HiWi - Student Assistant) Feb 2022 - May 2022

- Performed acoustic experiments by capturing over 1000 measurement reading to analyse and identify the major noise emitting factors by 2-bladed and 4-bladed propellers targeted for UAV applications.

Chair of Aero engine design, Brandenburgische Technische Universität **Cottbus**
(HiWi - Student Assistant) Nov 2021 - Jan 2022

- Conducted sensitivity analysis of heat exchangers with triply periodic minimal surfaces for a given volume under different lattice structures and identified the structures with performance increase in general and up to 30% compared to the conventional designs.

Chair of Technical Mechanics, Brandenburgische Technische Universität **Cottbus**
(HiWi - Student Assistant) Nov 2021 - Jan 2022

- Performed an in-depth analysis of heat exchangers and reformers, to refine the design of compact MGT-SOFC systems for the T-Cell project with objectives being to achieve a baseline efficiency of 68%, potentially reaching up to 97% with the utilization of recovered thermal energy for heating.

RESEARCH EXPERIENCE

Aero-acoustics department, Brandenburgische Technische Universität **Germany**
(Master's Thesis) Apr 2022 - Sep 2022

- Investigated aerodynamic noise from cylinders of different cross-sections with an objective to identify the cylinder that produces minimal tonal noise by comparing the cross-sections at different angles of attack (AOA), resulting in observations of triangular cylinders yielding the lowest sound pressure levels (SPL), followed by trapezoidal cylinders with a base angle of 60°and conversely, the highest SPLs were observed for trapezoidal cylinders at a base angle of 80°during very high AOA, and for square cylinders at low AOA.

Department of Aerodynamics, Université Catholique de Louvain **Belgium**
(Master's Project Work) Feb 2021 - May 2021

- Analyzed the Cahn-Hilliard equation using advanced numerical methods by implementing various time integrator and a second-order semi-implicit scheme. This approach improved computational efficiency by over 35% compared to conventional approaches and significantly enhanced accuracy, enabling the successful simulation of larger systems over longer periods.

Structures and Materials Department, Université de Bordeaux **France**
(Master's Project Work) Oct 2020 - Dec 2020

- Conducted an in-depth structural analysis to optimize the design of a metallic and composite rocket launcher combustion chamber, for a given sizing criteria constraints of effectively withstanding failure modes, while maintaining a less than 1% cumulative plastic strain in the ferrule, and maintaining a gap of 0.3 mm between the front dome and the ferrule.

Department of Electrical and Electronics Engineering, NIT Jamshedpur **India**
(Bachelor's Thesis) Dec 2018 - May 2019

- Worked on 'Distributed generation from biomass' – producing electricity from a renewable energy resource. Made a detailed mathematical modeling and simulation using software such as SAM (System Analysis Model) and MATLAB, considering all plant parameters and weather conditions, to derive a cost-effective and efficient methodology for generating electricity.

Vietnam National Space Center, Hanoi **Vietnam**
(Research Internship) Jun 2018 - Aug 2018

- Examined the trajectory of gas molecules in binary star systems by utilizing ALMA interferometer observations, which resulted in comprehensive findings of gas density imprints forming arcs or spirals, which significantly are influenced by the gravitational fields of binary companions.

EDUCATION

Masters in Transfer, Fluid, Materials in Aeronautical and Space Applications **Belgium, France, Germany**
Semester 3, BTU Cottbus Oct 2021 - Feb 2022

- Semester focused on Fluid mechanics, Flow visualization and Aero acoustics.

Semester 2, UC Louvain Feb 2021 - Jun 2021

- Semester focused on subjects such as Turbo-machinery, Aerodynamics and Thermodynamics.

Semester 1, Université de Bordeaux Oct 2020 - Jan 2021

- Semester focused on subjects related aero structures and materials.

Bachelors of Technology (Honors) in Electrical and Electronics Engineering **India**
(NIT, Jamshedpur) Aug 2015 - May 2019

- Majored in Electrical and Electronics engineering.
- Minored in Artificial Neural Network, Non-Conventional Electric Generation from Wind Energy.

TECHNICAL SKILLS

Programming: MATLAB, Python.
Statistical Softwares: Minitab, I-sight.
CAE Softwares: Siemens NX, Flow Efd, Simulink, Abaqus, Ansys.
CAD Softwares: nTopology, Inventor, Fusion 360.
MS Office: Word, PowerPoint, Excel, Power BI, Power Query, Power Automate.
Industrial Training: Systems Engineering, Robust Design for Engineering, Root Cause Analysis
Other Softwares: LaTeX, Video Editing.

INTERPERSONAL SKILLS

Thinking through first principles, Problem solving, Effective communication, Coping under stress, Time management, Critical thinking, Teamwork, Leadership qualities, Lateral thinking, Open to Challenges, Agile.

ONLINE COURSES AND LICENSES

Introduction to Aeronautical Engineering, TU Delft, Netherlands.
Kinematics: Describing motions of Spacecrafts, UC Boulder, USA.
Hypersonics- From Shockwaves to Scramjets, University of Queensland, Australia.
Astrophysics: Cosmology, Australian National University, Australia.
Renewable Energy and Green Building Entrepreneurship, Duke University, USA.

ACCOMPLISHMENTS

Association of Mathematics Teachers of India
Selected for the final round after clearing two rounds national.
20th Interstate Mathematics Competition
Secured a top position in the 20th Interstate Mathematics Competition.

LANGUAGE SKILLS

Telugu: Native, English: Fluent, Hindi: Advanced, German: Beginner, French: Beginner

INTERESTS AND HOBBIES

Aircraft Engineering, Product Strategy, Project Development, Electrified Aviation, EVTOLs, Space Technology, Entrepreneurship, Astrophysics, Clean Technology, Renewable Energy.
Chess, Table Tennis, Cricket.