StudentShapers Recruitment: Calling all *UG Engineering* students

ViRSE – A virtual supersonic wind tunnel laboratory for supporting learning in Aeronautics

Bursary: £390/week (8 full time weeks), for two students - £3120 in total per student.

Who should apply: Students with an aptitude for coding and enthusiasm for creating software, as well as an understanding of compressible aerodynamics and supersonic wind tunnels. We anticipate that students enrolled on programmes in the Department of Aeronautics will be best placed to meet these criteria, but all Imperial engineering undergraduates are eligible. Preference will be given to students who are not in their final year.

Campus/Location: South Kensington; some work can be done remotely, but on campus attendance will be expected for at least 50% of the project.

Project details:

This is an opportunity to develop a virtual supersonic wind tunnel (VSWT) for use in virtual-reality teaching within the Department of Aeronautics. You will be working in partnership with Dr Paul Bruce and Dr Maria Ribera Vicent (Aeronautics) to create a virtual laboratory environment to complement the Supersonic Wind Tunnel facilities in the Department. The student partners will develop a virtual environment to carry out supersonic flow laboratories, as well as the necessary code to simulate the flow for different test shapes and conditions. The added flexibility of a virtual environment will allow students to explore compressible flow and gain a better understanding of phenomena such as shock waves and expansion fans beyond the limitations of a physical wind tunnel and investigate the effect of wind tunnel design on its capabilities.
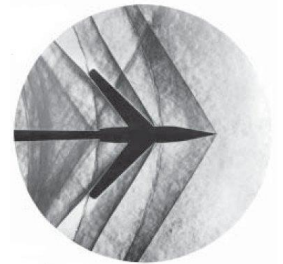
The student undertaking this engagement will gain a deeper understanding of compressible aerodynamics, as well as gaining technical skills and experience in coding (in C#/Unity), and in three-dimensional visualisation. They will also gain experience in collaborative software-development as part of a professional team.

This engagement is part of the ViRSE (Virtual Reality Student Experience) project, which is developing a virtual reality platform to ease the development and deployment of 'multi-player' virtual reality into Imperial's teaching across a range of departments and subjects. ViRSE is built on the Unity game engine, and all ViRSE applications (including this project) are also built within Unity; code is written in the C# programming language. Students will not need to build a VR interface, write rendering code, or concern themselves with networking or administrative issues; these are handled by the ViRSE framework and the Unity engine. The development in this engagement will concentrate on the creation of a three-dimensional 'environment' specific to the project, and creating and testing the code necessary to make it function, and to interface with the ViRSE system.

All ViRSE student shaper engagements will commence with a two-week full time training course, which will provide the necessary grounding in the C# language, object-oriented programming, the Unity engine, the ViRSE platform, and 3D modelling tools. This course will take place on-campus July 1st-12th 2024. In subsequent six project weeks the ViRSE student partners will lead on the development of the particular applications within Unity, in collaboration with the academic lead, and with the ViRSE team providing technical support and advice. These six project-development weeks are flexible in precise timing, but should take place over summer 2024, before the start of Autumn term of the 24/25 academic year.

How to apply:

Applications (300-500 words) should be made via the 'Student Expression of Interest' form on the StudentShapers website (here) or accessed using the QR code. This will then be distributed directly to the appropriate staff partner.

Deadline: 22nd March 2024

Contact details: *Contact Dr Maria Ribera Vicent (Aeronautics), m.ribera-vicent@imperial.ac.uk for further information*