StudentShapers Recruitment: Calling all students with an interest in Earth Science, Coding, and Virtual Reality

ViRSE – Seeing what lies beneath II - seismic reflection imaging and VR

**Bursary:** £390/week (8 full time weeks, £3,120 in total)

Who should apply:

Students with an aptitude for coding and enthusiasm for creating software, as well as an understanding of seismic reflection imaging. We anticipate that students enrolled on programmes in the Department of Earth Science and Engineering will be best placed to meet these criteria, but all Imperial 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 working hours.*

Project details:

This is an opportunity to further develop a three-dimensional 'seismic cave' for use in virtual-reality teaching within the Department of Earth Science and Engineering. You will be working in partnership with Dr. Rebecca Bell (ESE) and Dr Mark Sutton (ESE) to augment a seismic VR 'world' to visualise 3D seismic reflection data that was initiated in a Student Shapers project in 2023. Our system allows students to explore seismic datasets in virtual reality from within a cubic 'cave' that can be moved at will in 3D. This unique teaching tool mirrors expensive 'VR caves' used for employee-training by the hydrocarbon industry, who have appreciated that immersion in these data cubes is the best way to appreciate the details they contain. Our fully virtual solution allows us to provide the same immersivity and functionality but scaled up to allow the participation of large classes at once. This allows us to develop activities for teams of students such as exploring the seismic volume and identifying and interpreting suitable sites for wind turbine installation or Carbon capture and underground storage.
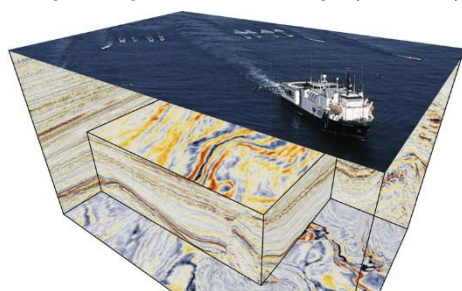
3D seismic data showing vertical cross-sections and horizontal slices. https://www.iris.edu/gallery3/var/albums/ research/lrsp/SB13.jpg?m=1400096100
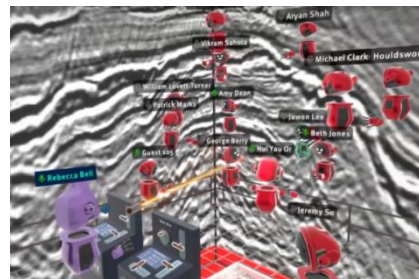
The current system provides effective visualisation of seismic volume data (inlines and xlines, depth/time horizontal slices through reflectivity and other attribute volumes), but lacks facilities for the integration of interpretation layers. This new project aims to (a) create workflows for the export of specific surfaces from seismic software, in the form of triangle meshes, and their import into and integration with the current system, and (b) provide facilities for students or staff to annotate seismic datasets while using the application, and to share those annotations.

The student undertaking this engagement will gain a deeper understanding of seismic reflection data, as well as gaining technical skills and experience in coding (in C#/Unity), and in 3D graphics and visualisation. They will also gain experience in collaborative software-development as part of a professional team.

Students using the Seismics VR application in ViRSE

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 seismics-specific 'domain' problems of developing workflows for the import of mesh surfaces, and the design and implementation of a three-dimensional annotation system, creating and testing the code necessary to make this function 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 1rd-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 above QR code. This will then be distributed directly to the appropriate staff partner.

Deadline: *22nd March 2024*

Contact details: *Contact Dr Rebecca Bell (Earth Science & Engineering), rebecca.bell@imperial.ac.uk for further information*