

## StudentShapers Recruitment: Calling all students with an interest in Manufacture, Coding, and Virtual Reality

### *Virtual Reality – Machining Simulator*

#### Bursary:

£330/week (8 full time weeks)

#### Who should apply:

Students with an aptitude for coding and enthusiasm for creating software, as well as an understanding and hands-on experience with manufacturing processes in general, and turning in particular. We anticipate that students enrolled on programmes in the Department of Mechanical Engineering or Design 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:

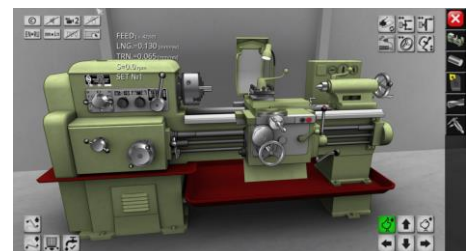
South Kensington, though with scope for remote working in the later stages of the project

#### Project details:

This is an opportunity to develop a 'machining simulator', or a virtual reality lathe, for use in virtual-reality teaching within the Department of Mechanical Engineering. You will be working in partnership with Drs Marc Masen, Idris Mohammed (Mech Eng) and Mark Sutton (ESE) to design, code and test a system to model and visualise the machining of components on a lathe. Starting with a blank workpiece, and the user-controlled contact between workpiece and cutting tool, the system will need to generate updated workpiece geometry, whilst providing feedback and advice to the user in terms of cutting speed, temperatures and sounds/vibrations. The objective is for this system to form the core of an interactive virtual reality application in which students can experiment with and become familiar with mechanical machining operations before they enter the Department's Student Teaching Workshop. The tool will be integrated into the Design and Manufacture modules in year 1 and 2 of the curriculum. It is envisioned that this project will develop a tool that can be integrated into our ViRSE system for deployment in VR within Imperial.

The student undertaking this engagement will gain 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.



*Example virtual turning software for a PC platform.  
from virtlabs.tech*

# STUDENTSHAPERS

All ViRSE student shaper engagements will commence with a two-week full time collaborative skill development and training course run by the Interdisciplinary EdTech Lab (IETL), which will provide the necessary grounding in the C# language, object-oriented programming, the Unity engine, and the virtual reality interface. This training will take place July 4<sup>th</sup>-15<sup>th</sup> 2022. 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 2022, before the start of Autumn term of the 22/23 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 April 2022**

**Contact details:** Contact Dr Marc Masen (Mechanical Engineering), [m.masen@imperial.ac.uk](mailto:m.masen@imperial.ac.uk) for further information