Virtual Radiographic Environment

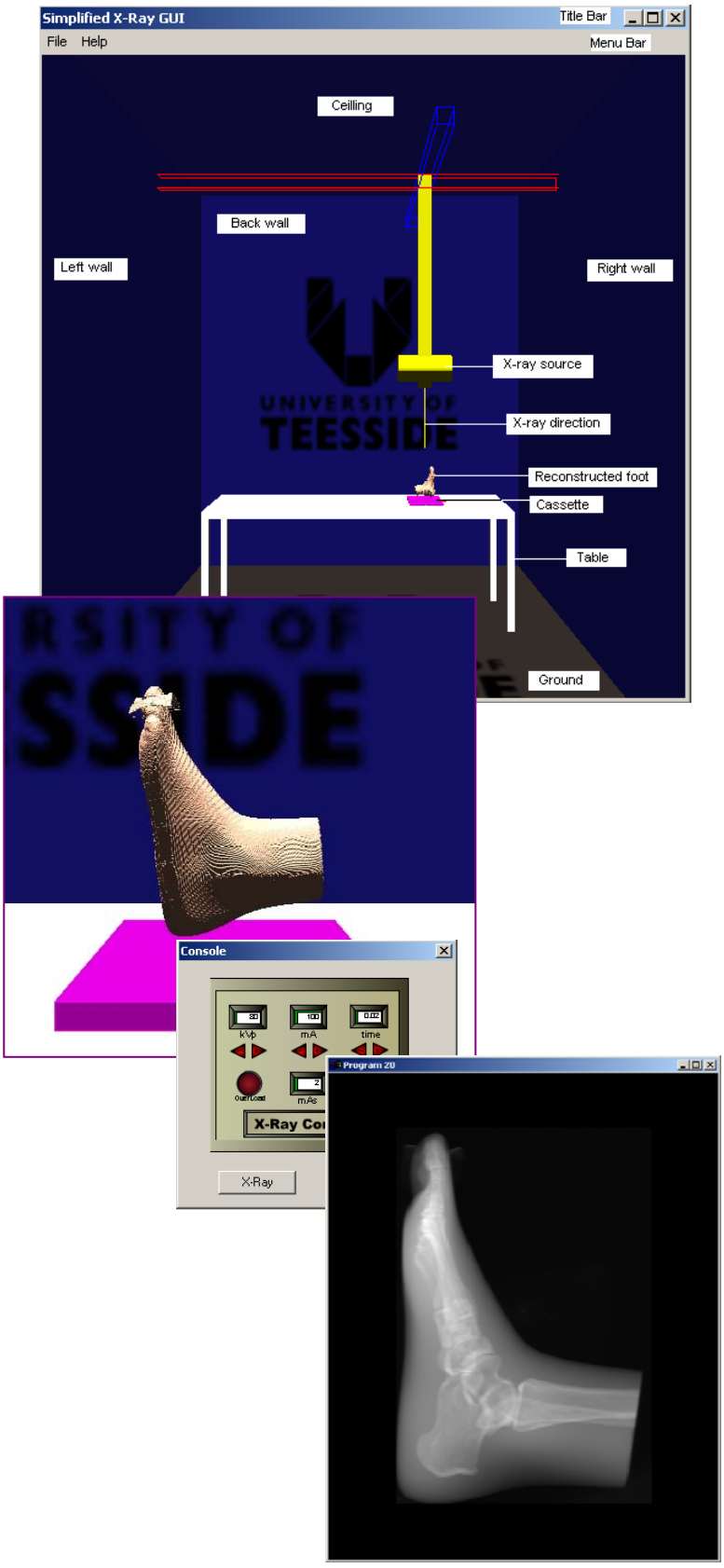
The goal of the Radiography Simulator is to improve the learning situation for pre-clinical Diagnostic Radiography students. Currently, pre-clinical training is performed on human substitutes called phantoms. While doing so the students are exposed to X-ray radiation. This environment must be regulated and adequately supervised by qualified staff.

These constraints prohibit or limit student engagement with the most effective types of learning i.e. practical experimentation and reflection on performance. If training could be done in virtual reality then the limitations would be removed. The virtual environment could be invoked anywhere, in University lab or the students private room.

Real time feedback on performance and the ability to conduct many experimental exposures to gain experience could significantly alter the learning experience for students.

The user interface has been developed for simple control with no expensive peripherals required. It consists of the X-ray emitter, the patient and the X-ray detector. A normal mouse controls the navigation of these objects.

The X-ray image is computed using simulation of the rays' path through a volume of contiguous DICOM data. The 3D surface model of the phantom in the interface is rendered from the same data using a marching cube algorithm. The interface scenes can be rendered in real-time allowing the phantom to be moved interactively. The software does not yet support real-time frame rates for the calculated X-ray image - though this may be possible in due course. The program currently runs on a PC / Windows platform but could be compiled to run on Unix / X window environments with a little effort.



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