

10 Years in Haptic Simulation with Greg Ruthenbeck: Nasendoscopy, Surgical Tissue, and Gravity Games

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Abstract. This demonstration is a collection of research work conducted over 10 years by Dr Greg Ruthenbeck. His work includes haptic virtual reality clinical training simulations, surgical tissue simulations, and games that demonstrate the difference between mass and weight by simulating the effect of different planets' gravity for high-school level physics students.

Keywords: clinical simulation, GPU surgical tissue simulation, science teaching.

1 Available Demonstrations

Haptic VR Nasendoscopy Simulator

<https://www.youtube.com/watch?v=CY7FJXpc90k>
<https://www.youtube.com/watch?v=YsZJQM3uqHM>

Haptic Skull Jigsaw

<https://www.youtube.com/watch?v=sjsU9w9vm7M>

VR Haptic Sinus Surgery Simulation

https://www.youtube.com/watch?v=y3Ky_q-K20k

VR Haptic Surgical Tissue Simulation

<https://www.youtube.com/watch?v=JzGUC8-ltI>
<https://www.youtube.com/watch?v=JzGUC8-ltI>

A Haptic VR Endoscopy Simulation

https://www.youtube.com/watch?v=LpPEDvd_RDg

I will also bring a Haptic Gravity Game that I developed for high-school students to experience the different between mass and weight for simulated everyday items (a tennis ball, a brick, a softdrink can) in different planets' gravity (Earth, Mars, Moon, Jupiter).

All of the simulations run on a Windows laptop that I will supply. In order to run it I will need access to a power outlet. I will also bring a haptic device (a Novint Falcon). I will need a table and a couple of chairs.

All of these simulations are my own work. All contributions will be acknowledged on the software (via watermark overlay).

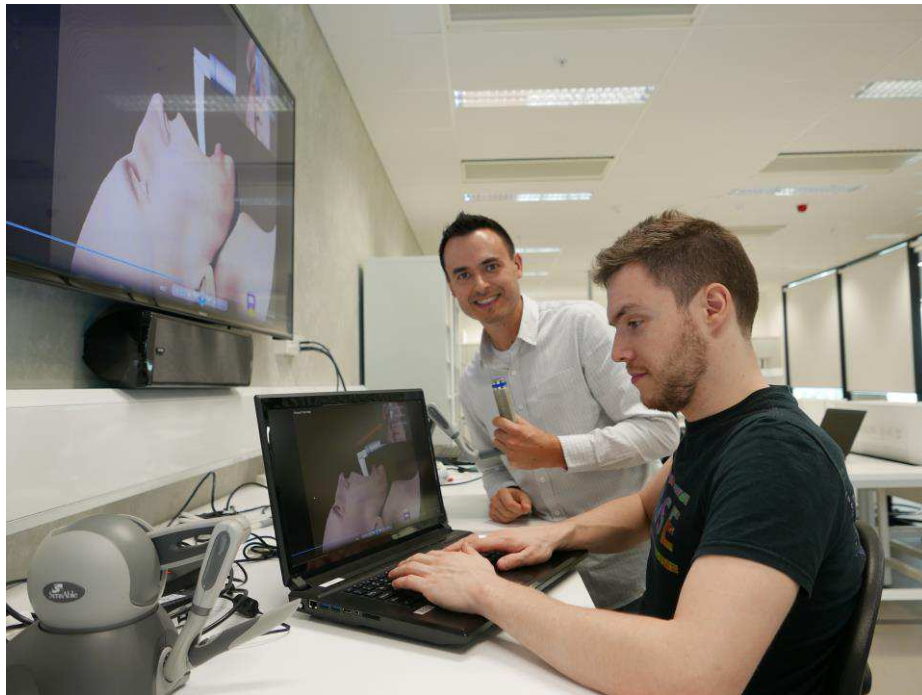


Figure 1. The author (standing) and Mark Gillard (Research Associate) in the Flinders University Simulation and Modelling Laboratory using the demonstration hardware