

A TOUCH OF VIRTUAL MEDICINE

Every nurse and doctor has to be able to accurately insert needles into their patients. But it's a technique that needs to be learned. And who wants to be the guinea pig?

It's possible but expensive to create medical simulators that recreate the sense of touch. One of the problems is the complexity of the computing required.

Fortunately, James Mullins and his colleagues at the Institute for Technology, Research and Innovation, Deakin University, have the answer.

They have developed a tissue simulation engine that rapidly generates models of soft tissue for simulating needle insertion.

"This research goes in a new direction," explains James. "Instead of using human experience to painstakingly generate the model, we use a robot arm to rapidly generate a map of the forces felt by the user when injecting a needle into tissue. We can then compare the data collected using the robot to real user data to make sure we are using valid results to generate our virtual models."

The automated system uses both real and proxy tissue to generate maps for different types and even combinations of tissue. The aim is to reduce the complexity of computations required while still retaining the quality of the simulation environment.

Simulating needle injections is just the first step. James hopes to move on to recreate the touch of a surgical scalpel and that's only the tip of the iceberg of what could potentially be done.

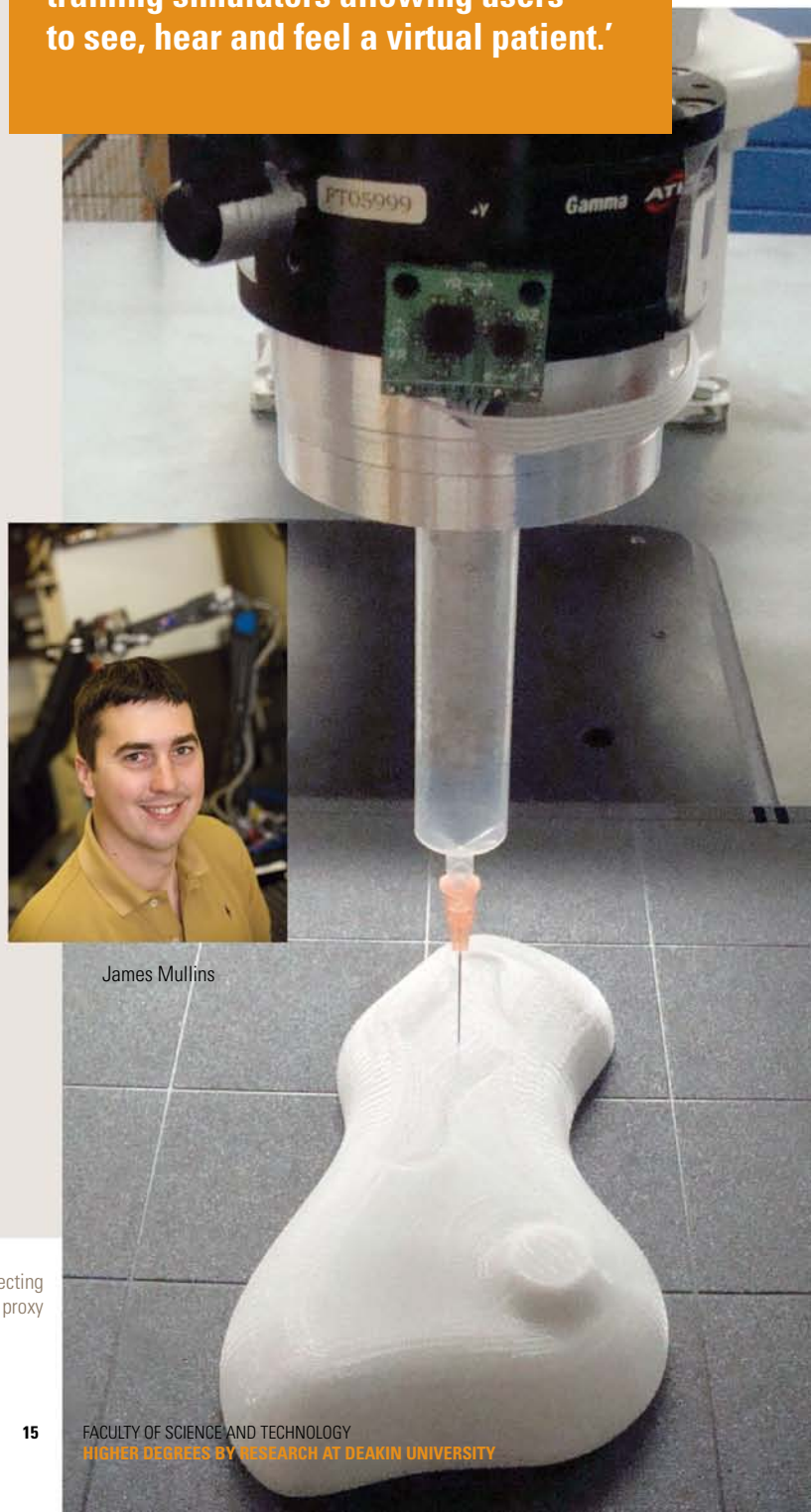
"Within 10–15 years, I expect we will see students training on simulators that allow users to see, hear and feel a virtual patient," says James. "And eventually we'll be able to download a virtual patient for training or to do a practice run of a complex surgical procedure."

FURTHER INFORMATION:

Centre for Intelligent Systems Research,
Institute for Technology, Research and Innovation
Principal supervisor: Professor Saeid Nahavandi
E: saeid.nahavandi@deakin.edu.au
www.deakin.edu.au/cisir



'Within 10–15 years, we will have training simulators allowing users to see, hear and feel a virtual patient.'



James Mullins

Epson robot injecting into tissue proxy