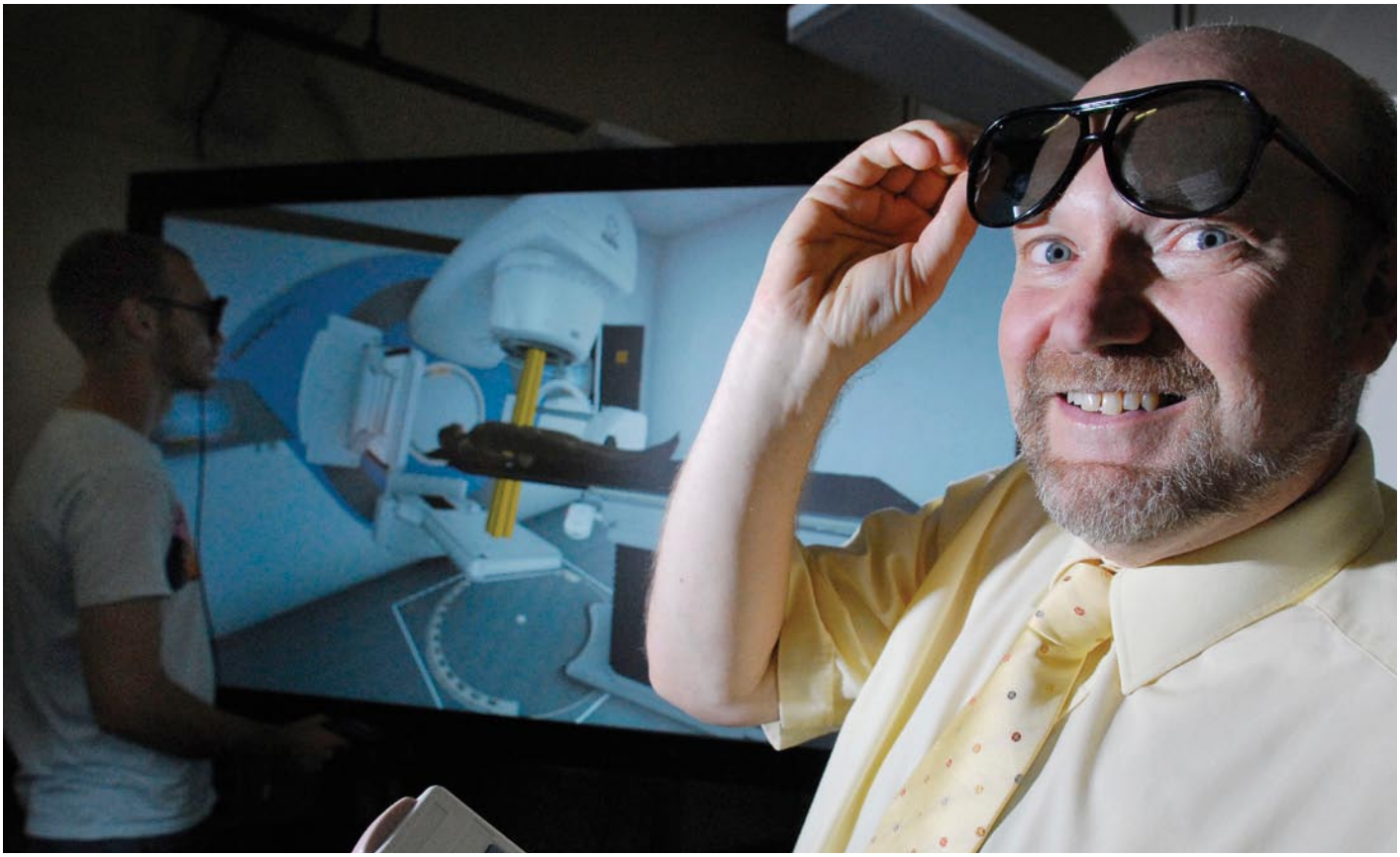
Immersive simulator to support radiation therapist training and ease cancer patient nerves

Prof Chris Langton
Queensland University of Technology



Prof Chris Langton's virtual reality radiation oncology simulator will help to familiarise patients with the procedure before treatment commences

The Queensland Cancer Physics Collaborative (www.qld-cpc.org.au) aims to develop an academically-minded, integrated and comprehensive partnership associated with "physics applied to the diagnosis and treatment of cancer" throughout Queensland, funded by Queensland Health.

It is the brainchild of Prof Christian Langton, who previously developed a technique of assessing osteoporosis with ultrasound, now utilised worldwide.

Prof Langton's latest innovation is 3D-ROSE, an immersive radiation oncology simulation environment that will allow the patient and their family to view a Linac machine and go through a realistic treatment experience.

Prof Langton said "There can be fewer more traumatic occasions in the life of an individual and their family than being diagnosed with cancer and prescribed radiotherapy treatment".

Due to high clinical demand and throughput, it is not always possible for a patient and their family to see a Linac treatment machine and room before they commence treatment, which means they are more stressed when treatment starts. With the 3D simulator, they are able to experience it and in the case of paediatric patients, so are their parents, which can help put everyone at ease before the patient undergoes treatment.

The simulator will replicate a particular treatment, for example head and neck, prostate or breast, incorporating the various fields and positioning aids. For children, the virtual patient could even be a cartoon character of their choice.

By collaborating with consumer groups, the development team is gaining an improved insight into how best to replicate the radiotherapy experience. For example, they were informed that the various noises are extremely relevant, such as the gantry moving or the "last man out" indicator sounding, and these have already been incorporated within the simulator. A further suggestion that is currently being implemented is a "patient's eye view" from the perspective of lying on the treatment couch.

Prof Langton is currently collaborating with the Paediatric Special Interest Group at Royal Brisbane and Women's Hospital. Currently, the staff at the hospital lead children and their families through planning and treatment scenarios to familiarise them with the sights and sounds of the radiation department, encouraging treatment compliance without the need for general anaesthetic. These sessions do, however, take actual treatment time from working machines.

Calming patients before their treatment could also have positive clinical outcomes as well as obvious psychological ones. Patients who are calmer breathe more steadily and hence reduce the potential for the tumour to move out of the radiation beam during delivery of treatment.

The simulator can also be used for the training of radiation

therapists and physicists who can play out different scenarios using the simulator, just as pilots train on a flight simulator.

During operation of the simulator, the user and observers wear special glasses that enable them to feel truly immersed within the treatment room; you can walk around the room and even look up into the treatment head. Using exactly the same hand-controller as they would clinically, users can operate the many features of a Linac including bed and gantry movement, EPID and cone beam CT, along with delivery of different radiation fields. Being a simulation, it can also visualise the radiation beam.

Prof Langton believes that 3D-ROSE has to be experienced first-hand to appreciate its true potential. Additional features currently being included in the simulator are 3D CT scans and treatment plans. Prof Langton said, "For radiation therapists, I see three potential main roles; initial acquaintanceship of the operation and control of a Linac prior to clinical placement, acquaintanceship of leading-edge treatment regimes not currently implemented locally and post-qualification continuing professional development."

The simulator is also being developed to replicate quality assurance (QA) procedures performed by physicists. Prof Langton said: "The treatment room could be set it up in such a way that the lasers are not correctly aligned, for example, to see if a trainee physicist would check for set-up errors before performing their routine QA measurements. We can simulate a number of scenarios which would not happen in a normal procedure, but which might occasionally occur due to malfunction, just as pilots train on a flight simulator. This project has a high real-world need and significant potential for positive impact, it is highly innovative and may be duplicated for the benefit of healthcare professionals, patients and their families worldwide."

Prof Langton is keen to collaborate with radiation therapy teams throughout Australasia. Contact him at christian.langton@qut.edu.au if you would like further information on the 3D-ROSE Simulator.

National Radiographers' and Radiation Therapists' Week 2009

The AIR is excited to once again partner with Philips in a week-long celebration of our profession, culiminating in World Radiographers' Day on Sunday 8th of November. Planning has already commenced for this celebration.

We are looking for a new theme. If you have any ideas regarding the theme for 2009 or for the design of the posters and lapel badges contact AIR email nrrtw@air.asn or tel (03) 9419 3336.

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