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Wednesday, 16 July 2008

search...

Home   News   Events   Science in WA   Science Partnerships   Ambassadors for Science

About Us

Home   Science News   SNWA News   The Second Life of science research   Our Feeds   Sitemap

The Second Life of science research

Written by Tony Malkovic
Wednesday, 25 June 2008

RESEARCHERS at the University of Western Australia are using Second Life to create online 3D worlds in which scientists can collaborate with other researchers and with students. Researchers at the university's WA Supercomputer Program (WASP) say Second Life and gaming engines such as Unity provide new tools and opportunities for scientists to share their work.

"There's a lot of money and expertise being thrown at hardware and software in the gaming industry, so the interesting question for us is can we exploit those developments in order to solve problems in other disciplines?" says Paul Bourke, a senior research fellow in visualisation at WASP.

One of the projects Bourke is involved with is recreating the remote Boolardy Station in WA's Mid West, which is the site proposed for the Square Kilometre Array radioastronomy project.

"The SKA project is in a very remote part of WA and in fact you can't just casually go there – it's a very remote and private property," says Bourke.

Virtual tourists: Visitors to the SKA site in Second Life /
Image: Paul Bourke, UWA

"So one of the things that the scientists are interested in doing is giving people a sense of what the site is like."

To achieve that, Bourke collected a series of 360-degree panorama images of part of the SKA site and joined them together for a cylindrical tent-like structure in Second Life.

"So those images were mapped onto a cylinder in Second Life, the avatars can walk into the centre of these cylinders and they can see and experience the 360-degree environment," he says.

"They can turn around, and perhaps there can be a scientist there working on the site, and he or she can be in the environment at that same time and pointing to things that are happening."

But Bourke says there are limitations to the data that can be used in Second Life and he has created another virtual SKA environment using Unity, which is more commonly used by game developers for first person shooter and driving games.

"Unity is a game engine designed exactly for walking through a 3D virtual environment," he says.

"So what we've done in Unity is taken the real aerial surveys of the entire Boolardy Station and we've mapped that onto the topology data that describes the elevation across the site.

"We've also taken the dish models from the dish engineers with the Australian Telescope National Facility and we've got the 45 dishes that they propose to put on the site in their 'real' positions.

"So as far as possible, we've tried to keep the thing honest – we've even got bushes and trees that we've taken from photographs of the site.

"But there are some things we've made up – for instance, there's a control room that doesn't exist there yet, of course.

"So the Unity based game lets you walk or drive to the site, you can see the dishes and how they're laid out, and you can go into the control room and see what computing power will be there in the future, and how you control the dishes."

Jason Tan, the senior computer support officer at WASP is also using Second Life, to teach high performance computing (HPC) to students who can 'virtually visit' the centre's Cray XT supercomputer and learn how to use it.

"I see education and training as students being immersed in their environment," he says.

"They can be at home, log in to Second Life with their lecturers and have a tutorial or lecture online, and they're able to view and collaborate with real time PDFs and PowerPoint in the environment itself.

The pair says such visualisations are a glimpse into the future with regards to how scientists can collaborate in more innovative ways.

"Jason's brief is to assist users of HPC, my brief is to assist scientists with their visualisations and for both of us that involves exploring up-to-date, new ways of doing things," explains Bourke.

"Most universities in Australia and overseas in computer science and multimedia are looking at these game engines, and are all looking at the same idea: can we leverage advances in the gaming industry to more serious work?

"For instance, Edith Cowan University even has a course called 'Serious Gaming'."

But it seems Australian universities generally not using the technology as much as those overseas.

"A lot of overseas universities, a lot of American universities, have engaged with Second Life much more than those here in Australia," says Bourke.

"For instance, there's one university – Bowling Green State University in Ohio – where you even have various university services online, such as counselling. Students can go to virtual offices to access the staff providing these services online."

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< Prev   Next >

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