

Virtual reality helps make sense of complex scientific data

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Virtual reality (VR) is a billion-dollar industry familiar to gamers but recently VR technology has been used to make sense of the enormous scientific dataset that is the Avon Longitudinal Study of Parent and Children (ALSPAC).

Based at the University of Bristol, ALSPAC (also known as Children of the 90s) researches the health and wellbeing of 14,500 people born in the Bristol area in 1991 and 1992. It holds an enormous amount of data on each person, which scientists all over the world use to ask and answer important public-health questions.

Responding to the recent Big Data VR Challenge, set up by the Wellcome Trust and Epic Games, creative studios around the world set out to find practical VR solutions to the problem of big-data generation. Competing teams were paired with live scientific research projects for a four-month period. Their challenge was to find ways to aid the visualisation and analysis of large datasets using VR technology.

The winners of the \$20,000 challenge were LumaPie (creative studio Masters of Pie and development firm Lumacode) for their flexible VR data-analysis tool, which used synthetic ALSPAC data to create a real-time data-analysis environment.

LumaPie's solution allows researchers to do remote collaborative analysis using VR headsets. It gives them the tools they need to take real data and use it to build an environment around them. The system, called

project V-Arc, employs specially designed visualisation methods that tap into the unique human ability to quickly recognise patterns in colour, size, movement and 3D spatial position. Researchers have the freedom to explore the data directly using 3D hand-tracking technology to point, click, slide and drag the data all around them.

Masters of Pie co-founder Karl Maddix explains:

"As humans, we just get 3D space as it is where we exist, it just feels more natural."

Dr Becca Wilson from Data2Knowledge who prepared the ALSPAC data said:

"Using the multi-dimensional space in [virtual reality](#) and the multi-sensory experience it provides, we are able to explore more aspects of the data at the same time."

Epic's European territory manager, Mike Gamble, added:

"All the teams created solutions that address the hurdles of analysing large data sets in new and ingenious ways but LumaPie have built a brilliant VR application that solves the challenge."

Iain Dodgeon, creative partnerships manager, at the Wellcome Trust commented:

"LumaPie has delivered an interactive simulation with tangible outputs that can be applied and adapted to other studies as well."

The winning partnership of ALSPAC and LumaPie plan to continue developing the V-Arc prototype as a robust and practical solution to the big-data problem.

Provided by University of Bristol

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