



3D scalable integrated displays (3D-SID)

Digital Projection Ltd and its partners are working together to create a cost effective and scalable 3D display system that could revolutionise the way we are taught, the way we work and maybe even the way we relax in front of the TV.

Key benefits

- three-dimensional images that can be viewed on a flat TV screen with the naked eye
- improves the quality and realism of flight and other visual training simulators
- revolutionises the visual media and entertainment industries

Advertisers want their latest campaign to be bigger than the last, event organisers expect this rock concert to be the most spectacular they've ever staged and award shows always want this year to be the ceremony you remember. In order to get this wow factor, they often turn to companies like Digital Projection Ltd for their expertise in creating the right visual statement. By providing projectors and projector technology, Digital Projection creates visual effects for advertising installations, music festivals, and even flight simulators. And it was in trying to meet their clients' demands for three-dimensional projection and large scale images that Digital

Projection began to develop the technology for 3D Scalable Integrated Displays (3D-SID).

The 3D-SID project aims to create a 3D digital display system that can be applied to a wide range of the most demanding applications in visualisation, simulation, cinema and entertainment. The research focuses on using digital micro-mirror devices to produce individual high resolution images that can be joined together to create a seamless larger picture. The programme also includes research and development designed to produce a three-dimensional image on a flat TV screen.

Due to run for two years, the project started on 1 March 2005 with total costs of £1.6 million. The consortium is receiving £700,000 in funding towards these costs under the DTI's Collaborative Research & Development initiative – part of the government's Technology Programme.

Manchester-based Digital Projection Ltd is leading the project, in partnership with Pandora International Ltd and the University of Cambridge.

Objectives

Though the consortium's ultimate aim for the project is to integrate their expertise to design and develop a prototype 3D Scalable Integrated Display, each of the partners has objectives that must be achieved if the final challenge is to be met.

For the University of Cambridge, the obstacle is the restrictions of existing technologies. The academic member of the consortium, it is currently researching the possibility of viewing 3D images on a flat screen, like that of a television. However, there are fundamental



limits imposed on their work by some of the readily available technology they have to use. For instance, there are certain electronic components within the video projection path that are fundamental to its operation but also impose limits on its performance in areas such as frame rate. Digital Projection is working with them to find ways around these limitations.

For the industrial partners, the challenge is image quality. The image has to be of a high resolution and low latency, whether projected on to a flat or curved surface and be able to compensate for any distortion. As there are applications for this technology in training aids such as flight simulators, being able to project a flawless image onto an unusually shaped surface, such as the cockpit of a fighter plane, would be essential, as would seamless image response time. Every time the pilot moves the joystick, the visual representation of the action must appear simultaneous. This is only possible with low latency.

Multiple images from multiple projectors should also seamlessly interlace. For example, one could project images from several projectors beside one another on a curved screen and make the image appear as if it were coming from one projector. In order to make this a possibility, Pandora International is working, with guidance from Digital Projection, to develop the warp engine, a technology that will allow them to manage the image and its behaviour in the ways necessary for the programme to succeed.

While in order to address any possible shortcomings from the projectors themselves, Digital Projection spent the first 12 months of the project examining its standard projection technology to see what could be done to maximise its performance within the programme. Changes include making the projectors brighter, capable of a higher grayscale resolution and capable of a higher frame rate.



Solutions

By attracting partners who bring a synergy to the project and by retaining a focus on the needs of the initial end users, Digital Projection believes that it can develop this technology and deliver it to its clients. A year into the project, the consortium is confident of meeting any remaining challenges and of completing a working prototype.

Results

With a little over a year of the project passed, Digital Projections has already made significant steps in terms of improving the fundamental performance of its projectors and the development of the warp engine alongside Pandora International is going well.

“If the programme is a success it would create real opportunities for our company and our partners,” says Digital Projection’s Dermot Quinn. “At the moment, there isn’t a UK base ability to deliver these requirements and people are having to use compromise solutions. This technology will move the industry forward and give us an edge in the market.”

Project contacts

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Collaborative Research & Development

Collaborative Research & Development is one of two business support solutions within the Technology Programme, the other being Knowledge Transfer Networks (KTNs). Its primary objective is to enable the industry and research communities to work together in strategically important areas of science, engineering and technology in order to develop successful new products, processes and services. It also enables the latest thinking and understanding to flow between universities, other research centres and business.

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