

## Science and Technology

### 3D Video Image and Measuring Technology by Calculation Speed-up-Deployment of Innovative Technology by Electronic Holography -

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#### Background of Research

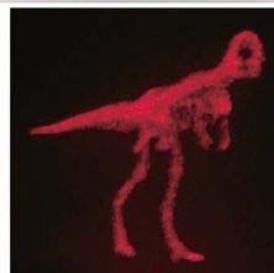
In the end of 2007, Ministry of Internal Affairs and Communications made an announcement, "by 2025, a 'dream 3D television' is to be developed." This statement indicates two things: first, though we hear news about new products of "3D TV" almost every year, such TVs are not 3D in a true sense, and also the commercial application of the 3D TV is facing a technological difficulty that can require 15 years or more from now for development.

Holography is a technology that can be incorporated in a 3D TV in the true sense, but its commercial application is currently difficult due to its enormous calculation load.

#### Achievements of Research

Our research group is promoting a study on calculation speed-up by improving calculation hardware. Receiving such study support funds as Precursory Research for Embryonic Science and Technology and Solution Oriented Research for Science and Technology from Japan Science and Technology Agency (JST), we developed a full-fledged circuit board exclusively for calculation in 2004. The latest system we developed uses 16 of this circuit board and performs the calculation capability a few thousand times faster than a personal computer. Such research results were taken up in the August 2009 issue of Optics Express (by the Optical Society in the United States), one of the leading journals in the field of optics, and the report was ranked No.1 for the number of monthly downloads of research papers.

In addition to the development of exclusive calculation hardware, we have been working on an easy-to-use graphic processor or GPU from the early stage of our research, and promoting its speed-up. The related paper on it gained a high evaluation as demonstrated by its being ranked No.1 for the number of monthly downloads for two months in a row, in September and October 2008 listed by Optics Express.



**Fig. 1: Circuit board exclusively developed for holography calculation (above) and example of playback using the exclusive system (one shot of a moving dinosaur) (below)**

#### Prospect of Research

The 3D TV has a prospect of creating a huge market and thus it is gathering attention from a number of fields. Its pathway is still long and severe, but we are promoting step by step the research that can be a basis for the technology.