

Visual Data Mining for Seismic Data Analysis Using Super High Definition Image towards Petascale Computational Science



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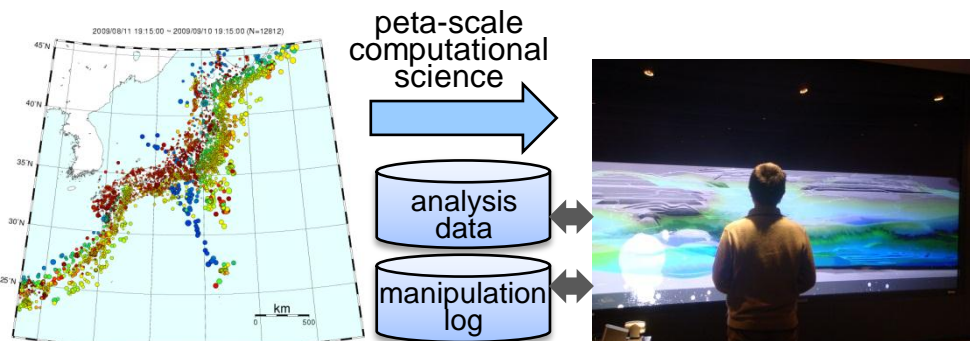
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■ Purpose of This Study

- This study aims at constructing the framework of analyzing large scale data based on visual data mining, automatic tuning, and distributed data management technologies towards **petascale computational science**.
- Especially, prototype of **seismic data analysis** environment is developed to analyze earthquake phenomenon by using super high definition visual data mining and data assimilation technologies.

■ ViNDAM Project

Concept of **ViNDAM project** (Visual Numeric Data Application Management)



- Data analysis using 2D image by manual manipulation

- Data analysis using super high definition visual data mining
- Reproducibility of data analysis using log data

■ Elemental Technology

1) Visual data mining

Visualization of large amount of data by changing parameters interactively using super high-definition stereo display.

2) Automatic manipulation

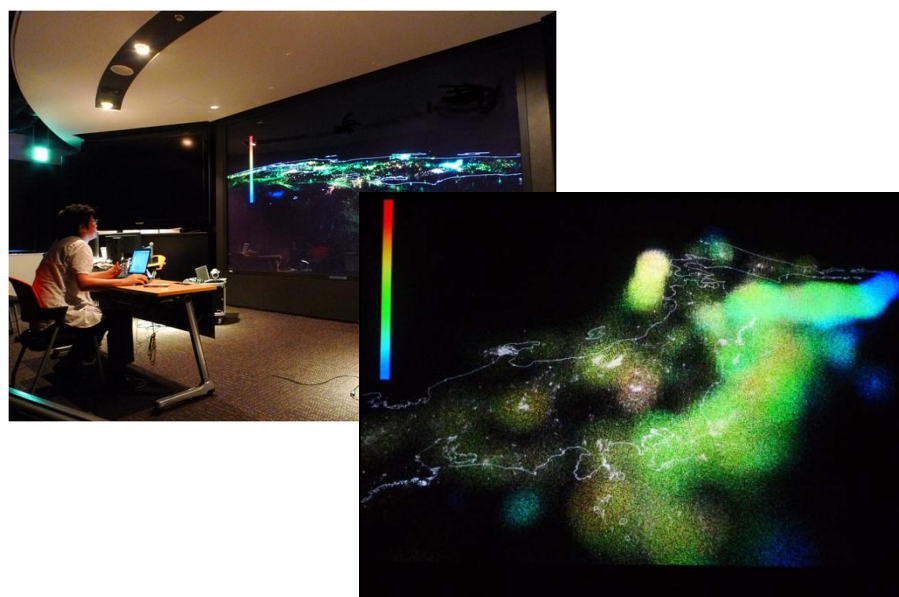
Data assimilation between measurement data and numerical simulation data by using automatic tuning technology.

3) Data management

Management of large amount of analysis data and log data using distributed database.

■ Super High Definition Visual Data Mining

- Prototype of **super high definition visual data mining** environment using 4K stereo display was developed to analyze seismic data.
- Hypocenter data that contains location, magnitude, and occurrence time, and statistical data such as b-value can be visualized interactively by changing various parameters in the three-dimensional virtual space.



■ Data assimilation

Numerical simulation data can be assimilated into observation data by using **automatic parameter tuning**.

