Framework for Seismic Wave Analysis using Visula Data-mining of Ultra Scale Data-set under Distributed Environment

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Seismic wave analysis is going to face a new aspect. It does not only reproduce and analyze phenomena from observational data or the data of numerical simulations, but discover new information or knowledge which are latent in data. For this realization, ViNDAM (Visual Numeric Data Application Management) is indispensable new information infrastructure [1].

Visual data-mining is an emerging research topic in large-scale scientific computing. Size of data sets through simulations and observations is huge, and they may be stored in distributed manner. We focus on development of visual data mining system under distributed environments, and discuss on future directions of individual technology and interdisciplinary collaborations. This system is named ViNDAM. ViNDAM is composed of seven elemental technologies. 'Cave System [2]' and 'HyperMap [3]' realize visual data-mining technologies, 'Grid Datafarm (Gfarm) [4]' and 'InfoSpace Governance Technologies [5]' make easier to manage large scale data sets allocated to remote systems as base technology of this system, 'Automatic Performance Tuning (AT) [6]' gives a guide for optimization of tunable performance parameters or simulation variables, 'Visual Parallelize Modeling Support System Scheme [7,8]' and 'Survey and Evaluation Systems for Numerical Algorithms [9]' also support for optimization of parallel modeling and of selecting of solution algorithms.

ViNDAM has been used by 'Seismic Wave Analysis and Its Knowledge Discovery by Large-scale Data-set [10]' as core application. In this research, especially, ViNDAM will provide AT technologies of adjustment parameter in order to reduce noisy data in these data.

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