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Title: Application of heterogeneous parallel computing to Earth observation and remote sensing

Abstract: Remote sensing is an active area of research in Earth and Planetary observation applications. Current imaging spectrometers used in those applications produce very high-dimensional scientific data, and the development of efficient techniques for storing and processing the massive amount of collected data on a daily basis is critical for current space-based and airborne remote sensing missions. Although only a few parallel processing strategies for hyperspectral imagery are available (most of them assuming homogeneity in the underlying computing platform), heterogeneous networks of workstations have rapidly become a very promising computing solution expected to play a major role in the design of high-performance computing systems for current and ongoing remote sensing missions. This presentation will address several highly innovative parallel algorithms for remote sensing data processing which have been implemented in fully heterogeneous platforms. The performance of the proposed algorithms is described in the context of real applications, such as the analysis of remotely sensed data collected over the World Trade Center (WTC) area in New York City, only a few days after the terrorist attacks that collapsed the two main towers in the WTC complex. Combined, these parts offer a thoughtful perspective on the potential and emerging challenges of applying heterogeneous computing practices to remote sensing problems

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