Special Issue on Impact of Advanced Parallel Computing / Cloud Computing Technologies for Image Guided Diagnosis and Therapy

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Medical imaging technology has revolutionized health care for a long time. The past decade has witnessed considerable advancements in imaging techniques, developing from structural to functional, from static to dynamic, enabling both individual- and population-based analysis. While the number of mulitmodality imaging-based diagnoses and procedures is increasing considerably, effective, safe, and high speed/quality imaging is important for much medical decision-making. However, it's impossible to realize these standards free from powerful computing technologies. Image processing with graphics processing unit (GPU)-based parallel computing technique is an alternative way to solve image processing problems in mulitmodality image diagnoses and telemedicine which require large times of processing as well as handling large amounts of information in "acceptable time". Cloud computing has been introduced only recently but is already one of the major topics of discussion in research and clinical settings. The provision of extensive, easily accessible, and reconfigurable resources such as virtual systems, platforms, and applications with low service cost has caught the attention of many researchers and clinicians. However, it is still in its infancy in the medical imaging domain, and there is currently low market penetration within the field. This situation may change rapidly in the near future. Among the potential driving forces for the increased use of cloud computing in medical imaging are raw data management and image processing and sharing demands, all of which require high-capacity data storage and computing. With the development of high speed/quality imaging technologies, medical imaging societies have to embrace parallel computing / cloud computing technologies and use them as a powerful tool to enhance the efficiency and accuracy of multimodality imaging data analysis.

In this special issue, we invite latest research works from both academia and practitioners to share experiences and ideas on how best we could make use of advanced parallel computing, and cloud computing technologies and turn them into clinical applications for image-guided diagnosis and therapy. All technological solutions from all level collectively contribute to one purpose which is better health for everyone.

Papers are invited from the following suggested topics but not limited to:

- Medical image processing and display;
- PACS and telemedicine;
- PACS on mobile cloud networking;
- Image guided surgical planning and navigation;
- Image guided 3D modeling and rapid prototyping, and surgical robotics;
- Data mining, data stream mining and big image data analytics;
- Standards and interoperability in PACS;
- Clinical application cases studies on Cloud infrastructure;
- Predictive modelling for Improving Healthcare;
- Personalized and patient centric image based diagnosis and therapy;
- Cloud platform for image post processing;
- Medical data and application portability across clouds;

- Trust, security and privacy;

Authors should submit their manuscripts in both Microsoft Word and Adobe PDF formats electronically by e-mail to one of the following guest editors indicating that the manuscript is for this special issue. Authors are encouraged to discuss with a guest editor to determine the suitability of their intended submissions.

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