Visualization of Functional Medical Data

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Abstract

Medicine is more and more supported by technology, for instance in clinical analysis and medical intervention. Medical imaging, that non-invasively reveals internal anatomy and physiology of a body, plays an important role since radiography was introduced. In the last thirty years, structural modalities have been placed side by side new image modalities that detect physiological activities within a certain tissue or organ, providing what is known as functional medical data.

Nowadays, a large amount of data is obtained with different modalities. To offer a deeper insight into this data, visualization can be helpful.

In this talk, an overview on different medical image modalities is presented, as well as corresponding techniques to turn the data into visual information that a physician can interpret for diagnosis. We will go through well known modalities such as computed tomography (CT) and magnetic resonance imaging (MRI), but also more specific medical image technologies for functional imaging, where the activation of body regions is measured during metabolic or cognitive processes. Finally, multi-modality visualization is investigated to provide functional medical data within its anatomical context. Therefore we will see an improvement in tissue characterization due to simultaneous imaging of morphological and functional information, such as the integration of MRI and Positron Emission Tomography (PET) into one single hybrid system.