PhD Thesis proposal

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VSPACS: a Video Signal Picture archiving and communication system

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Motivation

Picture archiving and communication system (PACS) have been around for a while. The most common example are DICOM servers used in most imaging centres. With the evolution of technology, clinic and research, several modalities - not necessarily imaging - started to be valued and used. These include signals (e.g. ECG, EEG) and video (e.g. monitoring, heat signature). This poses a major problem to traditional PACS: they are designed for "static" imaging and typically are not able to "merge" different kinds of modalities other than those that possess spatial structure or referential.

The main motivation of the current proposal is to extend the concept of PACS systems to handle video and signal (the VSPACS concept), namely by integrating the notion of time synchrony to enable spatial & time co-registration of data and enable streaming for viewing in typical web browser as already happens with imaging in most PACS solutions. To our knowledge this is still an open area although the technical support already exists.
The VSPACS will be integrated within Portuguese Brain Imaging Network (BIN) strategy to support the active repositories that are already gathering multimodal data (we expect to store a minimum of 5TB a year multimodal data). The BIN as “Rede Nacional de Imagiologia Funcional Cerebral (RNIFC)” is a FCT recognized and funded association that already has 5 year funding ensured. We think that PhD grants proposals for FCT funding can be well supported by BIN reasoning and have above average chances of success.

Objectives

- implement a VSPACS that implements the basic services existent in PACS systems (e.g. DICOM systems) to support video and biosignal
- provide services like random access in video-signal streaming

Challenges/Opportunities

- provide a model for synchronized access to multimodal data (e.g. be able to related ECG events to video frame occurring at the same time)
- propose new services in a new area, others than the ones described

References:

IEETA/SIAS: http://www.ieeta.pt/sias
Brain Imaging Network: http://www.brainimaging.pt/
MICCAI-grid: http://proton.polytech.unice.fr/MICCAI-Grid/program.html