Life-Long repositories for Brain aging studies

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Motivation:
In 2009 the Portuguese Brain Imaging Network (BIN) finally had its first data acquisition node inaugurated (a 3T MRI scanner exclusively for research purposes) and currently our minimum expectations is that we will gather a minimum of 5TB a year multimodal data. Besides the storage problems that might arise a major problem is foreseen in the future: the purpose of BIN is to enable a repository for studying aging process in human (healthy and unhealthy). This means that repository must have a life-time longer than typical project time-span and be able to "survive" changes in technology (e.g. new modalities, different formats) and in clinical/research (e.g. concepts, new ways of integrating data). This problem is shared within several ongoing projects (e.g. NeuroLog) at international level (see Miccai-grid proceedings).

This proposal aim is to establish a clear division between technologic data storage solution (a.k.a. databases) and data querying through the use a ontology based middleware that will map the evolving concepts and knowledge representation to the related data instances.
Currently we are aiming at establishing cooperation with projects with similar problem namely adapting/developing some already achieved solutions and evolve them into BIN own needs.
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:
- Devise and implement an ontology layer that mediates the query services and the data sources within the neuroscience context
- implement a framework that supports both ontology definition/change and mapping concepts to existing data sources within the BIN

Challenges:
- identify a knowledge core that will be less prone to change
- enable BIN users's customization namely having their own concepts model that may overlap or not with BIN model.

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
NeuroLog: http://neurolog.polytech.unice.fr/doku.php?id=neurolog