Other identified i-Spaces

General Information

i-Space Name	EuroBioImaging (Valencian Node): BIMCV. Medical Imaging Databank of the Valencia Region

The Valencian node **BIMCV** develops and provides access to a large database of **anonymized** data images and associated clinical records. This repository **Big Data** holds data from hospitals in the region of Valencia (5,000,000 inhabitants living in an area of 23,255 km^2, with an average of 5.3 million cases per year from 210 different imaging techniques). However, the node is able to incorporate data from other sources.

The access to these data-sets and tools is a breakthrough for research and population imaging studies.

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Partner Organisations	Instituto Tecnológico de Informática (ITI) Regional ministry of universal health and public health (CEIB-CS) (including research entities like FISABIO, IISLAFE, INCLIVA and CIPF)
Web site	http://ceib.san.gva.es

Platform and Services Information

Platform(s) & Service(s)

Resource/Value
- Cluster with 400+ CPUs, 4+ TB RAM and huge storage capabilities
- OpenStack for software virtualization
- Cloudera for Big Data Services, including the following tools: • Spark for analysis (using R or Python above MLLib) • Hadoop for distributing processing • NoSQL DB like Cassandra or HBase. • Additional tools like Sqoop, Hive, Pig… • HPC resources

Provided Services

Operational assets

- Generation of structured and fully anonymized information, medical images and relevant clinical and associated biological data and/or samples
- Access to a large database of imaging data (XNAT)
- Open access methodologies integrating different data types for population imaging and quantitative resources.
- High performance computing resources to facilitate image processing comparison, standardization and validation.
- Integration of resources and services through a platform managing information flow and image processing and extraction
- Offering aggregate results using big-data analysis from hospitals in the Valencia region (5 million inhabitants living over an area of 23.255 Km2. average number of 5.3 million of clinical cases per year, from 210 different imaging modalities)
- High knowledge (skill assets) in:
  - Bioinformatics
  - Public health policies
  - Data Science
  - Pattern recognition
  - Data mining
  - Machine learning
  - Legal/privacy issues

Selected Projects and/or Success Stories

10K Project Big Data in Brain Imaging (*Error! Hyperlink reference not valid.*)

- Use case based on neurologic images from BIMCV repository.
- Objectives:
  - Improve the infrastructure, data, methodology, and algorithms aimed at analyzing and controlling the evolution of different neurologic diseases.
  - Improve the post-processing of neurologic images.

BrainGIS (Brain Geografic Information System) (http://ceib.san.gva.es/brain-gis)

NeuroBIM-MS (Multiple Sclerosis) (http://ceib.san.gva.es/neurobim-ms)

Management and imaging knowledge extraction system from patients diagnosed with multiple sclerosis, based on the implementation of an instance of the general model **Cloud CEIB R&D**. **NeuroBIM-MS** aims to provide the scientific community with an open imaging bank from patients with multiple sclerosis in the province of Alicante. It also offers a set of tools that allows health information systems to obtain a series of reports with added value for the professional practitioner, among which to improve the quality of information from patient's electronic health records.

Other identified i-Spaces

MIDAS (Massive Image Data Anatomy Spine) (http://ceib.san.gva.es/midas)

- Low back pain is a prevalent disorder and a frequent cause of disability. It is associated with increased costs for the healthcare system and society in developed countries, affecting 70% of the general population at some point in their lives, with an annual incidence of 40%.

- Identifying predictors of chronicity has become a priority for researchers on lumbar pathology. Studies evaluating the presence of anatomical or structural changes in the lumbar spine by techniques such as CT, MRI or discography are not able to correlate these anomalies with a bad prognosis in low back pain.

- The concept that associates chronic pain with structural alterations is reconsidered taking into account the recent scientific evidence.

HQBRAIN (High Quality and reproducible Latin American Brain Mapping Network)

The scientific community is engaged in a profound debate on the validity of a large number of results stemming from research studies in the field of MRI and, consequently, on the foundations on which scientific knowledge is based. Much of the fundamental problems of this crisis are attributed to the lack of replicability of many of the published works. The reproducibility of a scientific study is defined as he ability of an entire analysis of an experiment or study to be duplicated, either by the same researcher or by someone else working independently, whereas reproducing an experiment is called replicating it.