

MEDICAL IMAGING DATANBANK OF THE VALENCIA REGION

DESCRIPTION OF THE TECHNOLOGY

The Medical Imaging Databank of the Valencia Region (**BIMCV**) is an image bank conceived as a knowledge repository designed to promote technological advances in medical imaging and to provide technology coverage services to support R&D&I projects.

The Valencian node BIMCV, managed by the Centre of Excellence and Technological Innovation in Bioimaging (CEIB) pertaining to the Conselleria de Sanitat Universal i Salut Pública, 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 km², with an average of 5.3 million cases per year from 210 different imaging techniques). The access to these data-sets and tools is a breakthrough for research and population imaging studies.

The system integrates cloud-based computational services with access to high-performance computer clusters from local and European infrastructures.

It provides open access methodologies with different types of data for population imaging

studies, quantitative resources and feature extraction.

The architecture defined in "Cloud-CEIB R&D" includes the following elements: a Search Engine to select cases of interest in images within the digital biobank; an Anonymizer, based on CTP (Clinical Trial Processor); XNAT repository (Clinical Trials Manager with Bioimaging for Research and Development), a support platform for clinical trials management with Bioimaging; and the core element of the architecture, MIDS (Medical Imaging Data Structure), standard for the storage and management of any type of medical image, and as promoter of knowledge.

Furthermore, this management system that integrates digital medical image will give support to the National Health System (SNS) central node and other international nodes, with the ability to incorporate data from other sources.

BIMCV is part of the European project "Euro-BioImaging". It is an infrastructure of distribution of biological and biomedical image structured and evaluated with criteria of quality, order and destination, in a coordinated and harmonized way at European level.

MARKET APPLICATION SECTORS

The node's expertise focuses on the development and validation of advanced imaging biomarkers, multivariate analysis and habitats clusterization, tissue signaling and radiogenomics. Furthermore, the BIMCV has specialized in epidemiologic studies based on medical imaging using the Big Data ecosystem (Cloudera), provided by the cluster "OpenMind.10K.cjpf.es" and prepared to work with most image processing libraries.

In short, the BIMCV aims to be a research and development space on image for healthcare and health management.

TECHNICAL ADVANTAGES AND BUSINESS BENEFITS

- BIMCV provides multilevel and multiology storage in a VNA (Vendor Neutral Archive).
- The node integrates access to high performance computing services in local and European infrastructures (Research Centre Príncipe Felipe and UPV-I3M infrastructure).
- The BIMCV defines a public access methodology in order to integrate different types of data for population imaging, quantitative resources and feature extraction.

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CURRENT STATE OF DEVELOPMENT

The Valencian network of public hospitals has been recognized by the European project Euro-Bioimaging as node of this infrastructure in the modality of "Emblematic Node for Specific Technology of Population Imaging". The aim of this project is to deploy a coordinated and harmonized distribution infrastructure in the European Union to boost innovation in European research in the field of Imaging Technologies in Biological and Biomedical Sciences. Once the international network is built, the database will be launched, allowing access to all stored and structured information to scientists from all European countries and beyond. This will advance research in Medical Imaging thanks to the large volume of data quality.

The services that the node provides are:

- The access to a selected set of medical images and associated information from a population database and according to multiple criteria.
- A catalogue of Medical Image Biomarkers and processing services to address different research challenges.
- A mechanism to configure and deploy virtual infrastructures on research computing infrastructures.
- The genetic correlation with imaging and phenotypic data.
- To allow data storage under specific projects.

INTELLECTUAL PROPERTY RIGHTS

BIMCV, in cooperation with the different foundations of biomedical research dependent on the Conselleria de Sanitat Universal i Salut Pública and other institutions bring together expertise on medical databanks, medical imaging biomarkers and computing infrastructures (<http://bimcv.cipf.es>).

COLLABORATION SOUGHT

The aims of this node are to transform the Medical Imaging Databank into an environment for open translational innovation with medical imaging data from a sufficiently representative sample population.

BIMCV gives a clear answer to the creation of an image research infrastructure for large population base, with associated data acquisition, the quantitative analysis of standardized data and access to the imaging data.

RELATED IMAGES

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