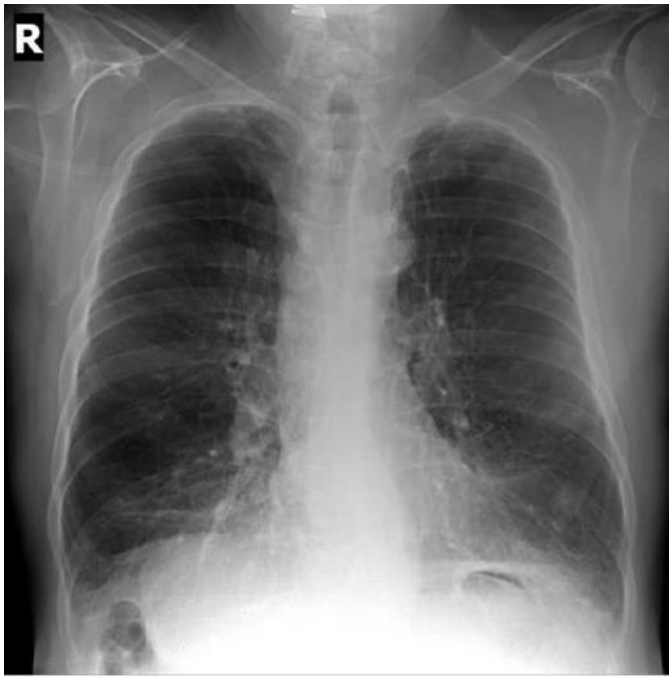
TOOL FOR THE AUTOMATIC DETECTION OF PATHOLOGIES IN CHEST X-RAYS AND VALIDATION BASED ON THE AUTOMATIC ANALYSIS OF MEDICAL REPORTS



labels: ['calcified densities', ' mammary prosthesis', 'osteosynthesis material', 'cardiomegaly', 'aortic elongation']

	Realidad	Predicción
Pulmón	1	97%
Calcificación	0	4%
Cuerpo extraño	0	2%
Mediastino	0	11%
Pleura	0	8%
Diafragma	0	9%
Pared abdominal	0	9%
Patològica	1	98%

Example of chest X-ray classification by type of finding.

Description

Radiographs (Rx) play a key role in the detection of different pathologies and are the main access route to Hospital Emergency Departments (HED). Radiological tests allow better decisions to be made, but sometimes these tests are not easy to interpret and require specialized technical personnel. On the other hand, the high pressure on hospitals, and especially on emergency departments, generates a large volume of X-rays, which require interpretation and rapid response. In addition, the implementation of techniques that require longer analysis time (e.g. CT or MRI scans) leave plain X-rays in the background, which affects ED performance. Thus, the use of intelligent radiodiagnostic support tools would improve the triage process and prioritize patient care.

Members of the research staff of the Universitat Jaume I of Castelló and the Foundation for the Promotion of Biomedical Health Research of the Valencian Community (FISABIO), through the General University Hospital of Castellón (HGUCS), in response to this dual need, have developed an intelligent system to support radiodiagnosis based on artificial intelligence (AI) computing techniques and the processing of large volumes of data (big data). The software consists of a module for the detection of pathologies in PA chest X-rays and associated reports to be used in production environments. The software will be modular and can be extended in the future with new modules for the detection of pathologies in other types of medical images. The tool can also be used in other medical environments, such as those dedicated to teleradiography.

Technical Advantages

The technical advantages translate into greater agility in diagnoses and very fast response times, thus improving triage processes in the ED.

The implementation of the software reduces waiting times in the ED, improves the quality of care and reports 100% of the pathological studies of simple radiology.

Development status and Industrial Property rights

The technology has been validated at laboratory scale and the experimental proof of concept has been completed. The latest technological development concerns the validation of the software in a relevant environment and the demonstration of the prototype in an operational environment.

The software has an intellectual property registration dated May 25, 2021.

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