

IST will develop new x-ray camera capable of creating three-dimensional images

An international consortium led by Instituto Superior Técnico will develop an innovative technology that will allow you to see the interior of the human body in three dimensions with a minimal dose of x-rays. This technology represents a radical alternative to traditional radiography, and has applications such as dental medicine, traumatology, cancer detection, as well as study materials.

Combining six European research centers and a high-value-added company, the consortium will receive funding of € 3.99 million, of which € 760,000 for Portugal, over the next four years. The aim of the VOXEL project is to develop a disruptive solution for X-ray tomography, which will allow 3D images to be obtained with minimum doses of ionizing radiation.

Funding was achieved through the highly competitive FET (Future and Emerging Technologies) projects of Horizon 2020, which reward visionary thinking, opening up new technological possibilities with radically innovative solutions. In this edition of the contest, only 26 projects were selected among the 643 competitors.

Marta Fajardo, project coordinator and FCT Researcher at the Institute of Plasmas and Nuclear Fusion of the Instituto Superior Técnico, states that "this new technology will allow to produce images at a lower dose, contrary to the technologies currently used, which, for the risk associated with ionizing radiation, are reserved to the most serious cases."

The revolutionary technology on which the project is based already exists for visible light, and is called a plenoptic image. It consists of using a special photography sensor capable of recording the image and the direction of the light rays, and only exists for the moment in the realm of visible light. This information is then processed to reconstruct an image in depth, from one pixel (two dimensions) to a volume element, or voxel (three dimensions).

The challenge of the research team is to develop a new x-ray camera based on this principle. To this end, the consortium combines specialists in such sensors (who have even applied them to the human eye), X-ray community leaders, metrology and tomography specialists, and numerical experts in three-dimensional image reconstruction.

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