BME PARIS
BioMedical Engineering
MASTER'S PROGRAM

AUTOMATED IMAGING TECHNIQUES

Open Your Mind Seminar

Friday, Oct 9 2020
1.30 pm – 3 pm

Arts et Métiers
155 Boulevard de l'Hôpital
75013 Paris
BEZIER amphitheater

Automation of methods for 3D reconstruction of the human body using biplane X-rays

Personnalised three-dimensional modeling of the anatomical structures of the human body from medical images is a growing research topic. Such software provides radiologists and surgeons with quantitative tools for clinical analysis, decision support, surgical planning and even surgical navigation. Despite the relevance and precision of shape that these models guarantee, they are obtained in a non-functional position and this represents a hurdle to the analysis of postural pathologies such as scoliosis. In this respect, low-dose biplane radiography is an alternative to CT scans both in clinical and biomechanical research. 3D reconstruction techniques combining epipolar geometry, image processing, statistical models, geometric transformations and human intervention have been developed to perform 3D reconstructions from bi-planar radiographies. Some of them are used in clinical routine. However, these methods remain highly dependent on the operator and the reconstruction time is consequent. In this presentation, we will present our team's progress in automating these methods without loss of precision. We will present the different types of representations of anatomical objects and we will see that computer vision, in particular machine learning, can considerably reduce operator time.

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