



Metal Artefact Reduction on Cone Beam CT images

Context

The [Epione research team](#) is located in Sophia Antipolis within the [Inria Sophia Antipolis center](#). It specializes in medical image processing, artificial intelligence and biophysical modeling. The [SITECH company](#) specializes in Cone-Beam-CT (CBCT) technology and develops software solutions around this technology in reconstruction, pre and post processing of medical images.

Motivations

Cone-Beam-CT (CBCT), is a medical imaging modality that was first used primarily in dental imaging but is experiencing a significant growth in other clinical areas. Indeed, this technology offers clinical practice competitive advantages over standard CT imaging. Thus, CBCT makes it possible to achieve isotropic resolutions of the order of 120 μm while emitting X-rays levels, that can be ten times lower than that of the traditional CT scans. Despite this weak radiation, certain artefacts linked to the presence of metal can occur during the reconstruction of the images. These elements interfere with the interpretation of acquisitions and are detrimental to medical diagnosis.

Objectives

The objective of the internship is to propose an algorithm allowing the reduction or even the elimination of artefacts linked to the presence of metal in maxillofacial CBCT images. Removal of the artefacts will be performed using artificial intelligence algorithms based on previous work [1] and will require the preservation of the anatomical structures adjacent to the artefacts. The approach may rely on two distinct strategies for the training phase based on either the removal or the generation of artifacts.

[1] Zihao Wang, Clair Vandersteen, Thomas Demarcy, Dan Gnansia, Charles Raffaelli, Nicolas Guevara, and Hervé Delingette. [Deep Learning based Metal Artifacts Reduction in post-operative Cochlear Implant CT Imaging](#). In MICCAI 2019 - Shenzhen, China, pages 121-129, October 2019.

Required Competences

- Master 2 in computer science, data science or applied mathematics
- Good knowledge of image processing, deep learning (pytorch, tensor-flow...)
- Fluent English (written, and spoken)
- Good coding skills in Python

Practical Information

The net monthly salary for the 5 to 6 month Master internship will be between 500 and 1200 euros depending on the initial location of the student. The internship will take place in Sophia Antipolis.

A PhD can extend this internship.

Contact Information

Send a CV, motivation letter and references to:

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