

Automatic fusion and alignment of SPECT and CT bone images

OsiriX Foundation

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1 General Conditions

Please refer to <http://www.osirixfoundation.com/awards.html> for General Conditions.

2 Category

This document describes a **Category 2** Plugin Award Project.

3 Description

Very often patient will undergo two different imaging studies for a given clinical problem. This is particularly true these days for the evaluation of bone diseases and cancer screening where patient will have a high definition CT scan and a nuclear medicine scan (SPECT) of the bones. While hybrid scanners that combine those two modalities are emerging on the market, many institutions will not have the device that allows to acquire those two studies at the same time, and will perform the two studies on two different scanners at different points in time. Therefore it is often desirable to merge a CT scan and a SPECT scan that were acquired separately. Several algorithms that allow to re-align and co-register the two studies automatically have been published.

The purpose of this project is to implement a fast and accurate registration algorithm that can be applicable to CT and SPECT images of a given patient directly within OsiriX. It is worth mentioning that OsiriX already provides a manual registration technique with an interactive 3D alignment tool that can still be used to further adjust small misalignment that the automatic program may have generated.

4 Requirements

The goal of this plugin is to perform automatic registration of CT and SPECT images based on automatic identification of the outer surface of the body and the bone structures. When activated, the plugin should allow the user to:

- Select the two image sets that need to be co-registered
- Automatically generate a new set of SPECT images that are aligned with the CT images.
- Allow an option to automatically display the results in the orthogonal MPR window of OsiriX while activating the manual 3D alignment tool that allows the user to further refine and adjust the aligned images
- Offer the option to automatically export the generated images as a new DICOM series in the same study

5 Deliverable

1. A fully functional plugin that automatically perform the alignment task described above
2. Export of the resulting SPECT images as a new series in the study
3. Display the results in the standard MPR window of OsiriX with an option for manual corrections using the existing tool of the program

6 Contact

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