

## Co-registration of whole-body medical images using 3D body models

As the first hospital in Norway, St.Olavs Hospital in Trondheim has both a whole-body combined PET-CT scanner and a corresponding PET-MRI scanner.

It is important to be able to compare images acquired at these two different scanners, and in order to do that directly, the images need to be co-registered to each other. One reason why this becomes challenging is that the patient is not positioned in the same manner in the two scanners. Typically the patient lies with hands stretched above the head in the PET-CT, but with the hands along the body in PET-MRI.

The available medical image co-registration software does not take into account the limited degrees of freedom in body motion due to the joints of the body, or the natural motion and deformation of muscles and other soft tissue. However, such modelling of movements and deformation has become quite advanced in the world of 3D animation.

The aim of this project is to explore the possibility of integrating the use of body models developed in the setting of 3D animation into the process of co-registration of whole body medical images. The project will involve exploring different approaches and available software tools, and suggest/find ways to implement this. The student will develop knowledge in medical imaging in general, and co-registration in particular. An interest in programming will be a clear advantage. If successful, the project will provide new and hopefully better tools for image co-registration.

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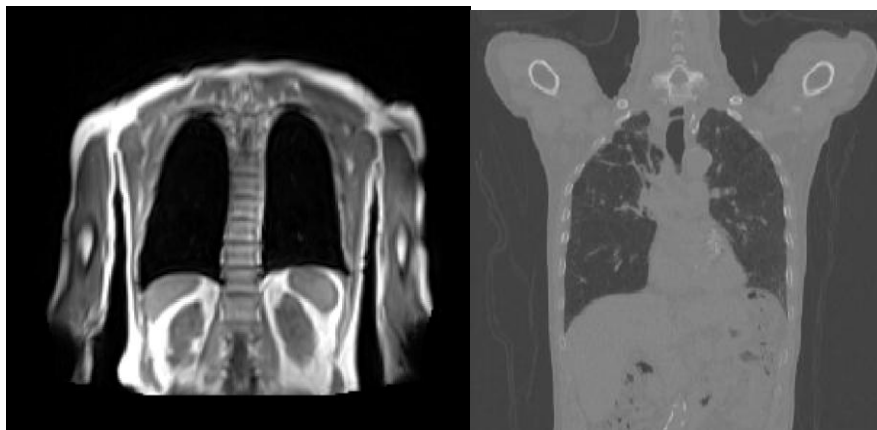


Figure 1. Example of MR-image (left) and CT-image (right), acquired with different patient positions. MR-image acquired with hands down, CT-image acquired with hands above head.