Abstract:
The development of modern robotics and compact imaging detectors allows the transfer of diagnostic imaging modalities to the operating room, supporting surgeons to perform faster and safer procedures. An intervention that currently suffers from a lack of interventional imaging is radioembolization, a treatment for hepatic carcinoma. Currently, this procedure requires moving the patient from an angiography suite for preliminary catheterization and injection to a whole-body SPECT/CT for leakage detection, necessitating a second catheterization back in the angiography suite for the actual radioembolization. We propose an imaging setup that simplifies this procedure using a robotic approach to directly acquire an interventional SPECT/CT in the angiography suite. Using C-arm CT and a co-calibrated gamma camera mounted on a robotic arm, a personalized trajectory of the gamma camera is generated from the C-arm CT, enabling an interventional SPECT reconstruction that is inherently co-registered to the C-arm CT. In this work we demonstrate the feasibility of this personalized interventional SPECT/CT imaging approach in a liver phantom study.