A multimodal training platform for minimally invasive robotic surgery


*DLR Institute of Robotics and Mechatronics, Germany
** PERCRO, Italy
***Fraunhofer IGD, Germany

This paper gives an overview of a multimodal training platform developed for minimally invasive robotic surgery, based on the DLR MiroSurge system. It describes the technological components and integration of the hardware and software platform and presents the first integrated training tasks that enable surgeons to get familiar with the robotic system. The training platform shares the same surgical operator workstation as MiroSurge and simulates the behaviour of the telemanipulator arms and the surgical instruments. Like the real system the training platform provides haptic feedback and 3D-vision. However instead of the real telemanipulator itself, a virtual environment with abstracted tasks is connected to the operator workstation. This allows reduction in costs, to provide various levels of difficulty, and to focus on the skills to be taught. Additional to the training tasks used to train the surgeon the system is capable to haptically link the trainee to an expert surgeon for a realtime transfer of skill. Thus a training platform is presented that aims at training a surgeon’s skills in handling the robotic system MiroSurge rather than training surgery in general.