Modular surgical training model for robot-assisted procedures

Reusable multimaterial organ models for realistic and cost-efficient surgical training.

At Fraunhofer IMTE, modular training models for robot-assisted surgery are developed to simulate realistic surgical procedures. The multimaterial design enables reusable and application-specific organ models that enhance training efficiency and precision.

The modular surgical training model serves as a reusable platform for training surgeons in robot-assisted surgery (RAS) systems. Designed primarily for the simulation of cholecystectomy procedures, the model reproduces the anatomical environment of an adult human gallbladder and surrounding organs at realistic scale.

Most components, such as sections of the liver, are represented only partially to reduce material usage, while maintaining essential anatomical fidelity for the procedure. The gallbladder itself is reproduced in its full anatomical size to allow accurate simulation of surgical access, dissection, and removal.

The multimaterial approach enables an adaptable level of realism and haptic feedback tailored to different training requirements. Furthermore, modularization facilitates easy replacement of individual components, enhancing sustainability and reducing operational costs for repeated training sessions.

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exhibit overview