Low-cost drive unit for applications in MRI environments

Ivan Vogt[1]
Thomas Gerlach, Marcel Eisenmann, Robert Kowal and Georg Rose
[1] Otto-von-Guericke-University

Robotics, dynamic phantoms, as well as assistance systems become increasingly important for magnetic resonance imaging (MRI)-guided surgery, as these can improve the usability and patients outcome. Typically, MR-compatible pneumatic, hydraulic or piezoelectric actuators were used. However, these approaches result in expensive and self-made solutions with a significant implementation effort. This work presents a low-cost and compact drive unit for active devices which does not interfere with the MRI. However, the specified handling and positioning of the ferromagnetic drive unit should be considered to guarantee safety as well as functionality. This technology can support a broad availability of assistance systems, robotics, and training environments during MRI-guided surgery.