CustusX

CustusX is an image-guided therapy (IGT) research platform dedicated to intraoperative neuronavigation and ultrasound imaging.

CustusX is a robust, accurate, and extensible platform with full access to data and algorithms and show examples of application in technological and clinical IGT research.

CustusX has been developed continuously for more than 15 years based on requirements from clinical and technological researchers within the framework of a well-defined software quality process. The platform was designed as a layered architecture with plugins based on the CTK/OSGi framework, a superbuild that manages dependencies and features supporting the IGT workflow. We describe the use of the system in several different clinical settings and characterize major aspects of the system such as accuracy, frame rate, and latency. RESULTS: The validation experiments show a navigation system accuracy of [Formula: see text]1.1 mm, a frame rate of 20 fps, and latency of 285 ms for a typical setup. The current platform is extensible, user-friendly and has a streamlined architecture and quality process. CustusX has successfully been used for IGT research in neurosurgery, laparoscopic surgery, vascular surgery, and bronchoscopy. CONCLUSIONS: CustusX is now a mature research platform for intraoperative navigation and ultrasound imaging and is ready for use by the IGT research community. CustusX is open-source and freely available at http://www.custusx.org [1)].

1)
Askeland C, Solberg OV, Bakeng JB, Reinertsen I, Tangen GA, Hofstad EF, Iversen DH, Våpenstad C, Selbekk T, Langø T, Hernes TA, Olav Leira H, Unsgård G, Lindseth F. CustusX: an open-source research platform for image-guided therapy. Int J Comput Assist Radiol Surg. 2015 Sep 26. [Epub ahead of print] PubMed PMID: 26410841.