



The art of medicine consists in amusing the patient while nature cures the disease.

Voltaire

NEWSLETTER



St. Olav university hospital

Photo: Gunnar Gjeldnes

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MIREIA - Mixed Reality in Medical Education based on Interactive Applications.....2

3D printing options at the new FOR-NorMIT facilities.....3

Navigation technology provided by NorMIT.....4

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MIREIA - «Mixed reality» in medical education based on interactive applications



«MIREIA is a unique Knowledge Alliance involving Higher Education institutions (HEIs) and companies that will combine the use of cutting-edge technology in immersive virtual technology and 3D printing with personalized learning content to promote the student-centred learning process of medical students and residents »

The NorMIT infrastructure, represented by SINTEF, St. Olavs university hospital and Oslo university hospital is currently participating in the MIREIA project co-funded by the Erasmus+ Programme of the European Union. The goal of the MIREIA project is to develop a methodology and tools to provide interactive pedagogical content for customized training, based on 3D models, such as anatomical models (with and without pathologies) built from real-patient cases (e.g. medical imaging studies) or virtual scenarios for basic training in minimally invasive surgery (MIS). Combining the use of cutting-edge technology in immersive virtual technology and 3D printing with personalized

learning content the project will promote the student-centered learning process of medical students and residents.



Photo:MIREIA

Contents will be accessible anytime and anywhere using portable devices, extended reality (XR) visualization technologies, or printed with 3D printing technology. This will allow students to train through immersive virtual environments

or in physical simulators that use personalized 3D printed models. Mentors will also be able to create and share any clinical experience as learning content for students such as medical imaging studies, 3D anatomical models based on preoperative studies, or video sequences of surgical procedures, following specific methodological guidelines. In addition, innovative tools will be implemented for the semi-automatic creation of customized 3D models for educational purposes.

Contact persons in Norway are Thomas Langø, SINTEF, Ole Jacob Elle, Oslo university hospital and Jan Magne Gjerde, St. Olavs Hospital.



Photo:MIREIA

Read more about the MIREIA project and the consortium partners at their web site www.mireia-project.eu

3D printing options at the new FOR-NorMIT facilities

During the recent years, the use of 3D printing for medical purposes has become a valuable technology for a variety of applications. At St. Olavs hospital in Trondheim, 3D printing has been a service provided by FOR-NorMIT. 3D-digital planning and 3D-printed models are now part of the standard clinical treatment for several departments at the hospital. Additionally the lab supplies equipment for research and development, and educational purposes. Jan Magne Gjerde has, since 2018, built up the 3D lab, which now consist of 5 printers utilizing 3 different print technologies. The new facilities in Klæbuveien 118 has enabled the installation of bigger and more advanced printers, and there is still room for further expansions. The latest addition is a MJP (material jetting printer) from 3D Systems. "This is the first professional/ industrial printer in the lab, and it represents a giant leap forward when it comes to consistency in print quality for complex models. That being said, I am still amazed by the capabilities of the smaller and inexpensive desktop printers as long as they are handled with love and care"



explains Jan Magne.

Since the start-up, the lab has produced more than 1000 parts. The majority of parts are patient specific anatomical models for the Orthopaedic- and Cranio-Maxillofacial-department. Surgeons find these models very useful in order to fully understand cases with complex anatomy, and opens new possibilities when it comes to pre-operative planning of surgical procedures. Customized surgical guides can also be printed at the lab. These guides ensures that the pre-operative planning can be executed with

high accuracy.

The printing process is slow. Large models can take as much as 24-48 hours to print, and this becomes a challenge especially in trauma-cases. In such cases, the key to success is good communication with the surgeon to understand exactly what he/she needs. Having the 3D-print service in-house makes a huge difference.

Jan Magne is St. Olavs university hospital's representative in the MIREIA project.

Printer Lineup:

3 x Prusa i3

Desktop Fused Deposition Modelling (FDM) printer. Materials PLA, ABS and PET-G.

1 x Formlabs Form 2

Stereolithography (SLA) printer. Materials: Photopolymers (including biocompatible)

1 x 3D Systems MJP3600

Material Jetting Printer (MJP). Materials. Photopolymer (including biocompatible)

Navigation technology provided by NorMIT

There are several suppliers of commercial software for image guidance during operations. Development of technological and medical possibilities goes hand in hand, and we want to offer image support tools also in areas where commercial solutions have not yet been developed.

NorMIT-Navigation is a national research platform for image-guided interventions. The platform is accessible to everyone, and the intention is that research results will be shared between the university hospitals in Norway. NorMIT-Navigation can be used both in clinical research and for implementation and testing of new methods and procedures.

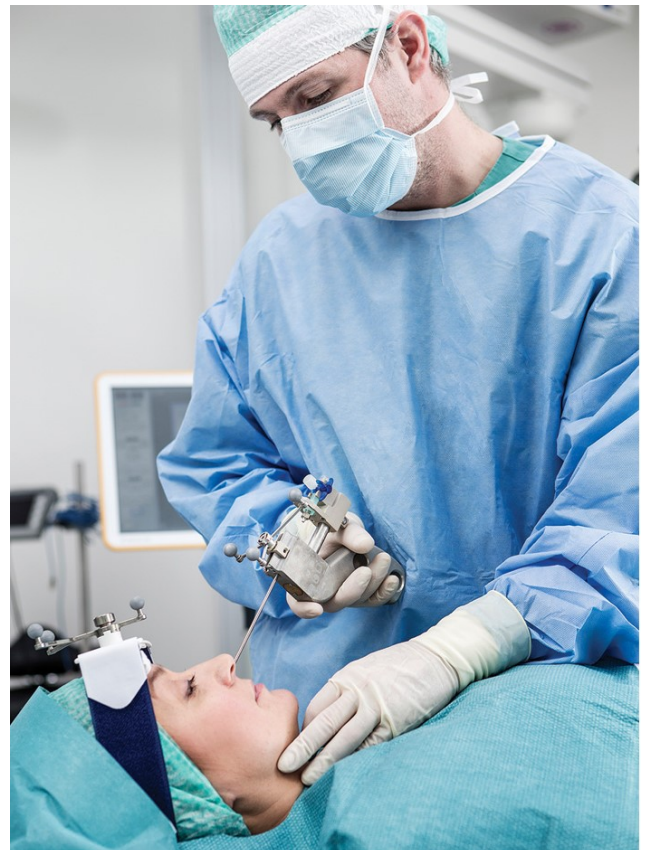
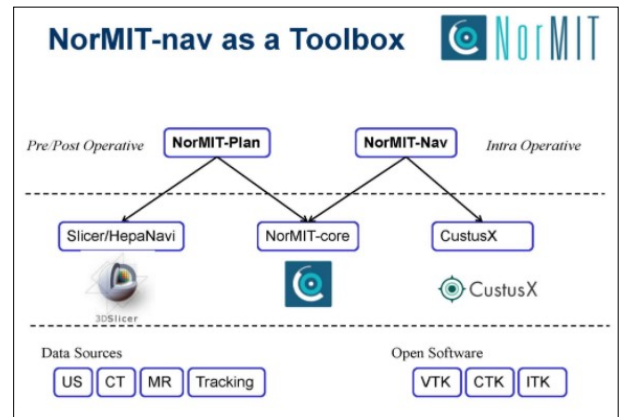
NorMIT-Navigation is based on two existing software platforms: NorMIT preoperative (planning module) and NorMIT intraoperative (image-guided).

Both software platforms are based on open-source software.

NorMIT intraoperative has been developed by SINTEF, medical technology in collaboration with NTNU and St. Olavs Hospital. To download the NorMIT intraoperative software, go to www.normit.no/nedlasting.

NorMIT preoperative is based on open-source software and is a hybrid planning and navigation platform for research, developed at the Intervention Center at Oslo University Hospital. The platform is based on 3D Slicer, which is an open source, and is supported by a number of universities and companies. To download the NorMIT preoperative, contact Ole Jakob Elle at the Intervention Center (oelle@ous-hf.no).

NorMIT-Navigation is installed and ready for use at Oslo University Hospital and St. Olav's Hospital. If your local hospital has the necessary medical infrastructure, we can help install the software locally.



Links:

The Norwegian National Advisory Unit for Ultrasound and Image-Guided Therapy (USIGT) www.usigt.org

The Intervention Centre <https://ivs.no>

The navigation platform CustusX <http://custusx.org>



Go to normit.no for more information!

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The Intervention Centre



5



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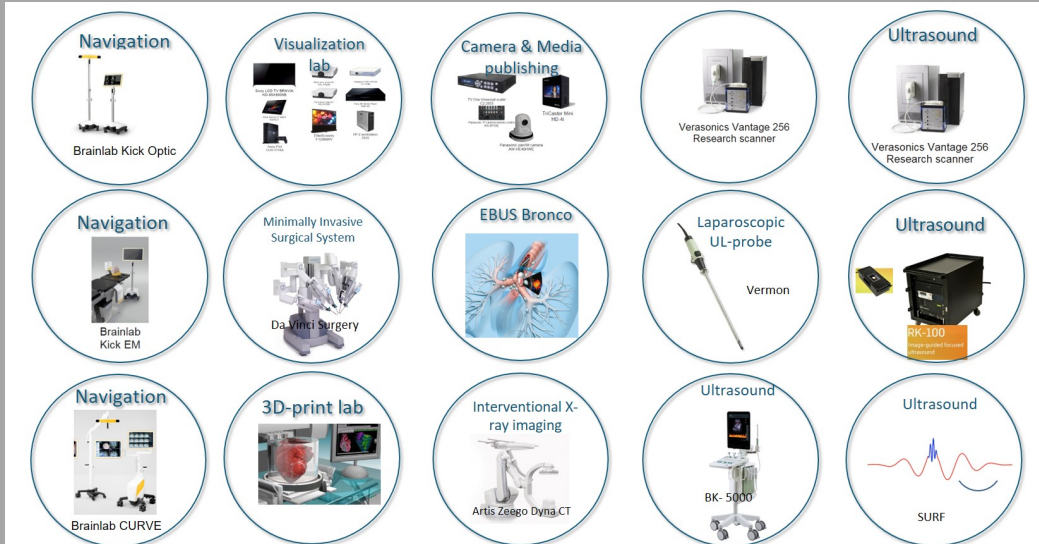


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