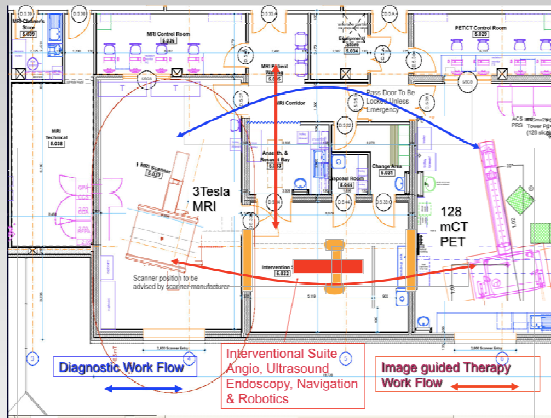


IIOS

INTEGRATED INTERVENTIONAL IMAGING OPERATING SYSTEM

*Researching the operating theatre
of the future*



Funded by

**Marie Curie Initial Training Networks
Seventh Framework Programme, the People
Programme**

www.iiios.eu

The Project

IIOS is a large-scale Initial Training Network funded by the FP 7 programme. Its goal is to develop novel techniques and devices to meet the needs of the imaging operating theatre, including:

- Introducing multimodality, non-invasive, image-guided diagnosis techniques
- Developing therapy based on MRI, ultrasound and biophotonics for cardiovascular procedures and cancer treatments
- Combining macroscopic MR, CT and PET imaging, ultrasound and microscopic biophotonics with existing techniques for minimally invasive interventions and surgery

The project will address these goals from a range of perspectives, investigating not only the technical design and workings of the operating system components, but also clinical and organisational aspects, including training of staff and workflow optimisation.



MR Imaging is a key research area

IIOS will also provide unparalleled training and education opportunities to doctoral and postdoctoral level researchers across the European Union, with particular emphasis on career development and interdisciplinary exchange of knowledge.

Training Programme

Training and education are key goals of the IIIOS project, and IIIOS offer an array of courses and seminars. Examples of topics covered include:

- Intellectual Property Rights and Exploitation of Results
- Safety in Imaging and Intervention
- Imaging Techniques based on Medical Photonics
- Techniques of Workflow Analysis and Optimisation
- Human - Machine Interface and Interaction
- Project Management

A full list of training events is available on the website (www.IIIOS.eu). Participation in these events is open to all interested parties. Anyone wishing to attend should contact IIIOS@dundee.ac.uk for further details.

IIIOS team members and participants at the 2010 IIIOS Summer School hosted by University Hospital, Oslo and NTNU, Trondheim.



The Partners

The IIIOS consortium is made up of ten main partners, including industrial, academic and clinical sites. Each contributes its individual strengths to the project.

The project will fund a total of 19 Marie Curie Fellowships across the network, comprising 13 Early Stage Researcher (ESR) and 6 Experienced Researcher (ER) posts.

University of Dundee www.IMSaT.org



IIIOS will be coordinated by University of Dundee from The Institute for Medical Science & Technology (IMSaT), a joint venture between the Universities of Dundee and St. Andrews.

Workflow analyses and optimization by numerical modelling and simulation, accompanied by MRI-compatible device design, procedure development and image management, will be University of Dundee's key research areas in the IIIOS project.



Innomotion MRI-compatible robotic arm (Innomedic GmbH) and 1.5T GE MRI scanner at IMSaT

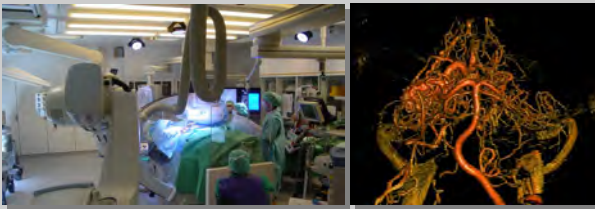
University of St. Andrews www.st-andrews.ac.uk/~biophot

The School of Physics and Astronomy, the School of Biology and the School of Medicine at the University of St Andrews stand at the forefront of biophotonics research. Within IIIOS, the programme includes Raman spectroscopy, microscopy, Optical Coherence Tomography, and their application in synergy and combination with MR imaging for bio-medical applications.

Oslo University Hospital

www.ivs.no

The Interventional Centre, Oslo University Hospital is an unequalled cross-disciplinarily organised hospital research department. The department has pioneered many image-guided therapy techniques and is developing novel technologies for computer-aided surgery. The clinical research department has three experimental operation rooms, all equipped for cutting edge image-guided therapies. The main role for the Interventional Centre in IIIOS will be: analysis of the current available technologies for intraoperative multimodal image visualisation and navigation; integration of real-time catheter tip tracking into a 3T MR system for intraoperative image navigation; and development of endoscopic and cardiovascular navigation and pre-clinical evaluation of the new methods.



Intra-operative robotic angiography at Oslo University Hospital

Norwegian University of Science and Technology

www.ntnu.edu

NTNU's cross-disciplinary research in medical technology delivers creative innovations that have far-reaching social and economic impact. NTNU has extensive strategic cooperation with SINTEF and the new St Olav's Hospital, which hosts very sophisticated equipment, especially regarding research within image guided therapy, medical imaging and the Operating Room of the future, which all are relevant for research in the IIIOS network.



Intra-operative imaging in St. Olav's Hospital, Trondheim

University of Homburg Saar

www.uni-saarland.de

University Hospital Homburg Saar (USAAR) is an interdisciplinary oriented health centre. The Clinic of Diagnostic and Interventional Radiology as part of the IIIOS Project focuses on development, evaluation and optimisation of MRI-guided procedures as well as advanced preclinical and clinical research of delivering vascular implants. Additionally, training for visiting scientists of all different kinds is offered.



MR performed at the Clinic of Diagnostic and Interventional Radiology, Homburg

MR:Comp GmbH

www.mrcomp.com

MR:comp GmbH is specialized in testing implants, instruments and accessories regarding to magnetic resonance safety and compatibility for device use within the MR environment. Research services are provided in the field of numerical simulation of electromagnetic fields analysing MR characteristics and RF-induced heating of e.g. implants and instruments.

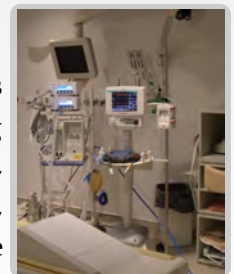


MR image of vena cava filter

University of Luebeck

www.mu-luebeck.de

The Department of Anesthesiology is responsible for patient care during interventional procedures in the fields of MRI, radiology, neuroradiology, radiation therapy, and nuclear medicine, in summary the "white zone". Based on this experience we are a partner of the IIIOS project with respect to patient safety, work flow and development of anaesthesiological devices in this area.



Anaesthesia is a key component of many procedures

Delft University of Technology

www.misit.nl

Using a clinically driven approach, MISIT (Minimally Invasive Surgery and Interventional Techniques) of the Delft University of Technology aims to improve minimally invasive techniques.



Steerable instrument

Dedicated research will be carried out in the fields of the human-machine interface, simulator interactions and advanced steerable and articulating instruments.

Fakultni Nemocnice u sv. Anny v Brne

www.fnusa.cz/icrcen.php

The International Clinical Research Centre (ICRC) concept is a result of long lasting co-operation between St. Anne's University Hospital Brno and the Mayo Clinic (Rochester, MN, USA). As part of IIIOS Project, the ICRC Team will be involved in development of novel technologies for real-time nuclear magnetic resonance (NMR) guided cardiac interventions, such as real-time NMR guided cardiac electrophysiology and mapping.



Prospective image of the ICRC

GE Medical Systems

www.gehealthcare.com

GE Healthcare provides transformational medical technologies and services that are shaping a new age of patient care. Within the IIIOS project, GE will work towards moving MR-guided catheter tracking technology onto a more modern MR technology platform and combine this with resonant marker devices to start developing clinical applications.



Research and development at GE

Associated Partners and Collaborators

www.smit.de

www.dgbmt.de

www.mentice.com

IIIOS has strong ties with its associated partners - The Society for Medical Innovation and Technology (SMIT), the German Association of Biomedical Engineering (DGBMT) and Mentice.

SMIT was founded in 1989 and is an international society promoting development in the areas of medicine. Its annual conference includes IIIOS scientific sessions, and in 2010 coincided with the IIIOS Summer School event.

DGBMT works to promote the development and application of innovative medical technologies in the country's healthcare system to help patients, heal people, and prevent disease.

Mentice AB provides medical simulation solutions for training, education and assessments. It has a particular focus in minimally invasive endovascular procedures.

IIIOS also collaborates with the US National Centre for Image-Guided Therapy (www.ncgit.org), Harvard Medical School (www.hms.harvard.edu) and the West German Heart Centre (www.wdhz.de).

Contact IIIOS

IIIOS welcomes your enquiries. Feel free to visit our website at www.IIIOS.eu or to contact us at any of the following:

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