Computer-Assisted Surgery

Winter

(in German: Computer-Assisted Surgery)

Module-ID: FIN-INF-120519

Abbreviation	Credit Points	Semester	Term	Duration	Language	Level
CAS	6	Winter	ab 1.	1 Semester	english	Master

Link:	LSF
Limited accessability:	
Responsibility:	Christian Hansen
Lecturer:	Christian Hansen
Classes:	• Lecture *Computer-Assisted Surgery* Seminar *Computer-Assisted Surgery* Team project *Computer-Assisted Surgery*
Applicability in curriculum:	- M.Sc. INF: Informatik - M.Sc. INGINF: Informatik - M.Sc. WIF: Informatik - M.Sc. VC: Visual Computing

Intended learning outcomes:
Students who complete this module ...

- have an in-depth knowledge of modern surgical and interventional imaging technologies such as iMRI, iCT and IOUS, as well as medical image processing
- understand methods such as surgical tracking, calibration and registration, which are essential for the development and application of surgical assistance systems
- can design and develop surgical planning and navigation systems.
- can write a state of the art report in the field of computer assisted surgery

- can read, analyse and briefly summarise scientific papers in a scientific report.

Within this module students can choose between a seminar or a team project. If students choose to undertake a seminar, they ...

- will be able to read, understand and present scientific publications in the field of computer-assisted surgery
- will understand how to critically analyse scientific publications and improve their ability to present the results of others' research.

If students opt for a team project, they ...

- will develop, test and evaluate a software tool in an interdisciplinary team
- will learn how to deal with conflict in interdisciplinary teams.

Content:
This lecture provides an overview of computer-assisted surgery. After an introduction to the basics, the state of the art in computer-assisted surgery is presented using clinical examples. The following topics will be covered:

- Fundamentals of intra-operative imaging
- Fundamentals of surgical visualisation
- Computer-assisted surgical planning
- Surgical navigation systems
- Surgical Augmented Reality
- Surgeon-Computer Interaction
- Robotic Surgery
- Medical Software Development and Evaluation

Workload:
56 h contact hours + 124 h self study

Pre-examination requirements:	Type of examination:	Teaching method / lecture hours per week (SWS):
Successful completion of the exercise/seminar	Oral exam	• Lecture (2SWS) • Seminar (2SWS) or team project (2SWS)

Prerequisites according to examination regulations:	Recommended prerequisites:
keine	

Media:	Literature:

Comments:

Revision #1
Created 2026-10-20 17:13:23 UTC by Fakultät für Informatik
Updated 2026-10-20 17:13:23 UTC by Fakultät für Informatik