

Module Handbook

TUK MODHB Homepage

Module INF-73-51-M-5

3D Computer Vision (M, 4.0 LP)

Module Identification

Module Number	Module Name	CP (Effort)
INF-73-51-M-5	<i>3D Computer Vision</i>	4.0 CP (120 h)

Basedata

CP, Effort	4.0 CP = 120 h
Position of the semester	1 Sem. in WiSe
Level	[5] Master (Entry Level)
Language	[DE/EN] German or English as required
Module Manager	Stricker, Didier, Prof. Dr. (PROF DEPT: INF)
Lecturers	Stricker, Didier, Prof. Dr. (PROF DEPT: INF)
Area of study	[INF-KI] Intelligent Systems
Reference course of study	[INF-88.79-SG] M.Sc. Computer Science
Lifecycle-State	[NORM] Active

Courses

Type/SWS	Course Number	Choice in Module-Part	SL	PL	CP	Sem.
2V+1U	INF-73-51-K-5	P	U-Schein	PL1	4.0	WiSe

- About [INF-73-51-K-5]: Title: "3D Computer Vision"; Presence-Time: 42 h; Self-Study: 78 h
- About [INF-73-51-K-5]: The study achievement "[U-Schein] proof of successful participation in the exercise classes (ungraded)" must be obtained.
 - It is a prerequisite for the examination for PL1.

Examination achievement PL1

- Form of examination: **written exam (Klausur) (60-90 Min.)**
- Examination Frequency: each semester
- Examination number: 61751 ("3D Computer Vision")

Evaluation of grades

The grade of the module examination is also the module grade.

Contents

From [INF-73-51-K-5] 3D Computer Vision:

- Projective geometry
- Camera models
- Camera calibration
- Parameter estimation methods
- Epipolar geometry
- Structure and motion from two and many views
- 3D reconstruction
- Reconstruction based on structured light

Competencies / intended learning achievements

Upon successful completion of the module, students will be able to

- explain the central challenges of computer-based vision,
- explain methods for reconstructing a 3D scene from 2D images,
- derive essential technologies and underlying mathematical approaches of three-dimensional vision,
- implement 3D Computer Vision procedures.

Literature

From [INF-73-51-K-5] 3D Computer Vision:

- Faugeras, Olivier. Three-dimensional computer vision: a geometric viewpoint. MIT press, 1993.
- Gortler, Steven J. Foundations of 3D computer graphics. MIT Press, 2012.
- Hartley, Richard, and Andrew Zisserman. Multiple view geometry in computer vision. Cambridge university press, 2003.

Requirements for attendance of the module (informal)

None

Requirements for attendance of the module (formal)

None

References to Module / Module Number [INF-73-51-M-5]

Course of Study	Section	Choice/Obligation
[INF-88.79-SG] M.Sc. Computer Science	[Specialisation] Specialization 1	[WP] Compulsory Elective
[INF-88.79-SG] M.Sc. Computer Science	[Specialisation] Specialization 1	[WP] Compulsory Elective
Module-Pool	Name	
[EIT-AC-MS-C-TW-MPOOL-7]	General Elective Modules Master A&C	
[GS-CVT-CS-2022-E-MPOOL-6]	Catalog Electives Computer Science 2022	
[GS-CVT-CS-E-MPOOL-6]	Catalog Electives Computer Science	
[INF-KI_Ba_V-MPOOL-4]	Specialization Bachelor TA Intelligent Systems	
[INF-SIAK-DT-AI-MPOOL-6]	SIAC Certificate "Digital Transformation" - Modules INF "Artificial Intelligence"	
[MV-MB-INF-2022-MPOOL-6]	Wahlpflichtmodule M.Sc. Maschinenbau mit angewandter Informatik 2022	
[MV-MBINFO-MPOOL-6]	Wahlpflichtmodule Maschinenbau mit angewandter Informatik	