

Only the german version of the module description as part of the study regulations is legally binding.

Module name	Geometric Modeling and Animation
Module number	INF-25-Ma-FVC-GMA
Responsible lecturer	Prof. Dr. Stefan Gumhold stefan.gumhold@tu-dresden.de
Qualification objectives	Students know which hardware and which algorithms are required to create an animatable digital image of a human character. They are familiar with surface representations and know the basic algorithms for evaluating and displaying these surface representations. You will be able to assess which 3D scanning technology is best suited for which application. They know the algorithms required to generate surface models from 3D scans. They know the mathematical representations for rigid body transformation and can use these to articulate 3D models. They are familiar with character animation techniques and know how to convert a simulated surface into a character animation.
Content	Contents of the module are surface representations with point-based, implicit and subdivision-based representations, 3D scans with a discussion of scanning methods and scan processing algorithms, skeleton-based object representations with mathematical representations for rigid body transformations, representations for articulated objects, basics of inverse kinematics and algorithms for extracting skeleton representations. Further contents are character animation of different techniques for the representation and animation of virtual humans.
Teaching and learning methods	The module comprises lectures of 2 SWS, exercises of 2 SWS and the self-study. The language of instruction for the lectures and exercises is English.
Prerequisites for participation	The competencies to be acquired in the Foundations of Computer Graphics module are a prerequisite for the Diplom degree program in Computer Science and the Master's degree program in Computer Science.
Applicability	The module is a compulsory elective module in the Diplom degree program in Computer Science in the main course in the subject area Visual Computing and Machine Learning, which must be selected in accordance with Annex 2 to the examination regulations. In the Master's degree program in Computer Science, the module is a compulsory elective module in the open track in the subject area of Visual Computing and Machine Learning as well as the supplement, which must be selected in accordance with Annex 2 to the examination regulations. The module can only be chosen once in the Master's degree program in Computer Science. The module cannot be chosen in the Master's degree program in Computer Science if this module or a module with essentially the same content from a degree program with which the admission requirements according to § 3 of the study regulations were fulfilled has already been completed. The module creates the prerequisites for the

	modules listed under prerequisites for participation.
Requirements for earning credit points	The credit points are earned if the module examination is passed. The module examination consists of a written examination lasting 90 minutes. A bonus achievement for the written examination is the completion of 15 hours of exercises aben. The examination language is English.
Credit points and grades	6 credit points can be earned through the module. The module grade corresponds to the grade of the examination.
Module frequency	The module is offered every summer semester.
Workload	The total workload is 180 hours.
Module duration	The module comprises one semester.