

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

Module name	Multimodal user interfaces
Module number	INF-25-Ma-FHI-MMUI
Responsible lecturer	Prof. Dr. Gerhard Weber gerhard.weber@tu-dresden.de
Qualification objectives	Students know the requirements of multimodal systems for the integration of input and output media for fusion and their serial and parallel use. They master the processing of gestures in connection with voice input as well as voice output and sonification, they recognize the characteristics of haptic interaction with actuators and sensors for several degrees of freedom.
Content	The contents of the module are multimodal user interfaces and their evaluation for several modalities using examples. These include the architecture models of multimodal user interfaces and, using EMMA, an XML technique for describing multimodal web-based interaction. Other topics include VoiceXML, voice assistants and the requirements for spoken dialogs, recognition of time-invariant features in speech and gestures using methods such as dynamic time warping and hidden Markov models, machine learning methods suitable for speech processing using neural networks, sonification and spatial sound methods for other acoustic forms of representation, as well as haptification in conjunction with force feedback and gestures in the context of haptic interaction.
Teaching and learning methods	The module comprises lectures of 2 SWS, exercises of 2 SWS and the self-studium. The language of instruction for the lectures and exercises may be German or English and will be determined by the lecturer at the beginning of each semester and announced in the usual manner.
Prerequisites for participation	In the Diploma degree program in Computer Science, in the Bachelor's degree program in Computer Science and in the Bachelor's degree program in Applied Computer Science, the competencies to be acquired in the module INF-25-Ba-MCI Fundamentals of Human-Computer Interaction are a prerequisite.
Applicability	The module is a compulsory elective module in the subject area Human-Computer Interaction at d Interactive Media in the Diploma degree program in Computer Science in the main course of study, which must be selected in accordance with Annex 2 to the examination regulations. In the Bachelor's degree program in Computer Science, the module is a compulsory elective module in the subject specialization, which must be selected in accordance with the appendix to the examination regulations. The module is a compulsory elective module in the Bachelor's degree course in Applied Computer Science in the specialization in Media Informatics and in the specialization in Medical Informatics, which must be selected in accordance with the annex to the examination regulations. In the Master's degree course in Computer Science, the module is a

	compulsory elective module in the open track in the subject area of Human-Computer Interaction and Interactive Media and 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 selected in the Master's degree program in Computer Science if this module or a module with the same content from a degree program in which the admission requirements according to § 3 of the study regulations have been fulfilled has already been completed. The module fulfills 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 non-public oral examination as an individual examination lasting 20 minutes. The examination language may be German or English and will be specified by the lecturer at the beginning of each semester and announced in the usual manner.
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.