

Modul BA-INF 122	Scientific Visualization				
Workload 270 h	Umfang 9 LP	Dauer 1 Semester	Turnus jährlich		
Modulverantwortlicher	Prof. Dr. Reinhard Klein				
Dozenten	Prof. Dr. Reinhard Klein, Jun.-Prof. Dr. Thomas Schultz				
Zuordnung	Studiengang B. Sc. Informatik	Modus Wahlpflicht	Studiensemester 4., 5. oder 6.		
Lernziele: fachliche Kompetenzen	Assuming knowledge in calculus and linear algebra as well as in imperative programming, the module focuses on the main concepts of scientific visualization. Based on the visualization pipeline and the classification of mapping methodes, visualization algorithms and data structures for cartesian 3D scalar fields (such as medical CT-data), unstructured 3D vector fields (e.g., from computational fluid dynamics), tensor fields are discussed and basic knowledge about information visualization will be presented.				
Lernziele: Schlüsselkompetenzen	Understanding and speaking technical English (as a prepraration for the master program), analytical problem description, creativity, self-dependent solution of practical problems in the area of scientific and information visualization, presentation of solution strategies and implementations, self-dependent literature research, collaboration abilities, self-management				
Inhalte	Basics (visualization pipeline, data structures, categorization of data types), interpolation and filtering, mapping techniques, volume visualization, vector field visualization, tensor field visualization, data Management and large-scale visualization, information visualization				
Teilnahmevoraussetzungen	<b>Empfohlen:</b> alle Module aus folgender Liste: BA-INF 022 – Analysis BA-INF 105 – Einführung in die Computergrafik und Visualisierung BA-INF 021 – Lineare Algebra BA-INF 014 – Algorithmisches Denken und imperative Programmierung				
Veranstaltungen	Lehrform	Gruppengröße	SWS	Workload[h]	LP
	Vorlesung	40	4	60 P / 105 S	5,5
	Übungen	20	2	30 P / 75 S	3,5
	P = Präsenzstudium, S = Selbststudium				
Prüfungsleistungen	Mündliche Prüfung (benotet)				
Studienleistungen	Erfolgreiche Übungsteilnahme (unbenotet)				
Medieneinsatz					
Literatur	<ul style="list-style-type: none"><li>• A. C. Telea: Data Visualization - Principles and Practice, CRC Press, Second Edition, 2015</li><li>• C. D. Hansen, C. Johnson: Visualization Handbook (hardcover), Academic Press, 2004</li><li>• W. Schroeder, K. Martin, B. Lorensen: The Visualization Toolkit, 4th ed. (paperback), Kitware, 2006</li></ul>				