

<b>Module name:</b>	<b>Visualization and HCI</b>
<b>Abbreviation:</b>	MIN-VISH
<b>Study Semester:</b>	2 <sup>nd</sup> Semester (SoSe), Frequency: once a year
<b>Responsible for module:</b>	Volker Ahlers
<b>Teaching staff:</b>	Volker Ahlers, Ingo Ginkel
<b>Language:</b>	German or English
<b>Place in curriculum:</b>	Master, 2 <sup>nd</sup> Semester, compulsory module
<b>Teaching methods/SWS:</b>	2 SWS lecture, 2 SWS exercise/project
<b>Work required:</b>	Lecture = 34 h Exercise = 34 h Own study time = 112 h
<b>Credit points:</b>	6 CP (= 180 h)
<b>Prerequisites acc. to exam regulations:</b>	None
<b>Recommended prerequisites:</b>	None
<b>Learning goals:</b>	<p>Algorithmic skills: Knowledge of fundamentals of human computer interaction (HCI); understanding of visualization algorithms; understanding of different data representations</p> <p>Analysis, design and realization skills: Analysis of datasets and visualization requirements; design and realization of visualization solutions; implementation of algorithms</p> <p>Technological skills: Knowledge of the use visualization techniques in various fields of application</p> <p>Methodological skills: Knowledge of possibilities, benefits, and limits of using visualization techniques; identification of errors in visualization solutions</p>
<b>Contents:</b>	<ul style="list-style-type: none"> <li>• Basic principles: Human computer interaction (HCI), perception and cognition, gestalt laws, color models, data representation</li> <li>• Scalar data: Charts (e.g., line and bar charts, scatter plot, histogram), color mapping, contouring, multivariate data</li> <li>• Volume data: Isosurfaces, volume rendering, ray casting</li> <li>• Vector fields: Glyphs, stream lines, streak lines</li> <li>• Software: Current visualization libraries and graphical development toolkits, applications to real data</li> </ul>
<b>Examinations:</b>	Examination (written or oral examination) and experimental work
<b>Media forms:</b>	Lecture: Presentation, board, examples, discussion Exercise: Independent problem-solving in groups, project work with presentation of results, assessment and discussion of solutions, further discussion
<b>Literature:</b>	Lecture notes Telea, A.C.: Data Visualization. A K Peters, latest edition Ward, M., Grinstein, G.G., Keim, D.: Interactive Data Visualization. A K Peters, latest edition Ware, C.: Information Visualization. Morgan Kaufmann, latest edition