

Module MA-INF 2214	Computational Photography				
Workload 180 h	Credit points 6 CP	Duration 1 semester	Frequency every year		
Module coordinator	Prof. Dr. Matthias Hullin				
Lecturer(s)					
Classification	Programme M. Sc. Computer Science	Mode Optional	Semester 2. or 3.		
Technical skills	Foundations in optics and image sensors. Signal processing and inverse problems in imaging. Color spaces and perception. Image alignment and blending. High-dimensional representations of light transport (light fields, reflectance fields, reflectance distributions). Computational illumination.				
Soft skills	Students learn <ul style="list-style-type: none"><li>• to read and understand current literature in the field</li><li>• to implement standard computational photography techniques</li><li>• to propose and implement solutions to a given problem</li><li>• to follow good scientific practice by planning, documenting and communicating their work</li></ul>				
Contents	Topics: <ul style="list-style-type: none"><li>• Image sensors</li><li>• Optics</li><li>• Panoramas</li><li>• Light fields</li><li>• Signal processing and inverse problems</li><li>• Color, perception and HDR</li><li>• Reflectance fields and light transport matrices</li></ul>				
Prerequisites	<b>Required:</b> Basic knowledge in computer graphics, data structures, multidimensional analysis und linear algebra, numerical analysis and numerical linear algebra, C++ or MATLAB				
Format	Teaching format	Group size	h/week	Workload[h]	CP
	Lecture	60	2	30 T / 45 S	2.5
	Exercises	30	2	30 T / 75 S	3.5
	T = face-to-face teaching; S = independent study				
Exam achievements	Oral exam (graded)				
Study achievements	Successful exercise participation (not graded)				
Forms of media					
Literature					