Technology
Arts Sciences
TH Köln

Course Manual BV1

Image Processing

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— General information

Long name	Image Processing
Approving CModule	BV1_BaMT
Responsible	Prof. Dr. Dietmar Kunz Professor Fakultät IME im Ruhestand
Valid from	summer semester 2022
Level	Bachelor
Semester in the year	summer semester
Duration	Semester
Hours in self-study	60
ECTS	5
Professors	Prof. Dr. Dietmar Kunz Professor Fakultät IME im Ruhestand
Requirements	Basic course mathematics Basic course compuer science Basic course signal theory
Language	German
Separate final exam	Yes

Literature

Burger/Burge: Digitale Bildverarbeitung

Tönnies: Grundlagen der Bildverarbeitung

Final exam

Details	In the oral exam, typical problems in image processing are presented, The student should make suggestions conserning suitable algorithms to be applied and to explain typical effects of these algorithms.
Minimum standard	The students must be able to explain the oberation of linear filters and the structue of the spatial frequency spectrum. Moreover, they must be able to recall imortant nonliear filters.
Exam Type	EN mündliche Prüfung, strukturierte Befragung

Lecture / Exercises

Learning goals

Goal type	Description
Knowledge	Image processing camera calibration homogeneous point operations linear filters processing in frequency domain filter banks and wavelets image compression adaptive filters change of sampling grid change of quantization morphological filters color image processing motion correspondence analysis registration
Skills	select problem specific image processing methods
Knowledge	Being able to describe important image processing algorithms, including their algorithmic structure and their effect on images.

Expenditure classroom teaching

Type	Attendance (h/Wk.)
Lecture	3
Tutorial (voluntary)	0

Special requirements

Accompanying material	electronic lecture sheets
Separate exam	No

− Practical training

Learning goals

Goal type	Description
Knowledge	Image processing camera calibration homogeneous point operations linear filters processing in frequency domain filter banks and wavelets image compression adaptive filters change of sampling grid change of quantization morphological filters color image processing motion correspondence analysis registration
Knowledge	Image processing with ImageJ ImageJ Java Eclipse
Skills	implement image processing methods Plugins Macros
Skills	apply image processing methods using ImageJ
Skills	Identify and assess efects of processing in images

Special requirements

Accompanying material	sample images development tools image processing (ImageJ) program documentation IDE (Eclipse) plugins and plugin templates for ImageJ
Separate exam	Yes

Separate exam

Exam Type	EN Übungsaufgabe mit fachlich / methodisch eingeschränktem Fokus lösen
Details	process images according to given exercise problems and present results
Minimum standard	All exercises must be processed so far that expected effects of the algorithms become observable.

Expenditure classroom teaching

Type	Attendance (h/Wk.)
Practical training	2
Tutorial (voluntary)	0