Bauhaus-Universität Weimar

Image Analysis and Object Recognition

Exercise Sessions

Summer Semester 2024

(Course materials for internal use only!)

Computer Vision in Engineering – Prof. Dr. Rodehorst
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Contact Data

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Consultation Hours: on request

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General Information

Biweekly meetings:

- Thursdays starting at **11:15** (starting time was updated after the first lab class)
- Lecture Hall 6, Coudraystraße 9 A

Six assignments:

- to be solved in small groups (3 members per group)
- serve as exam prerequisite

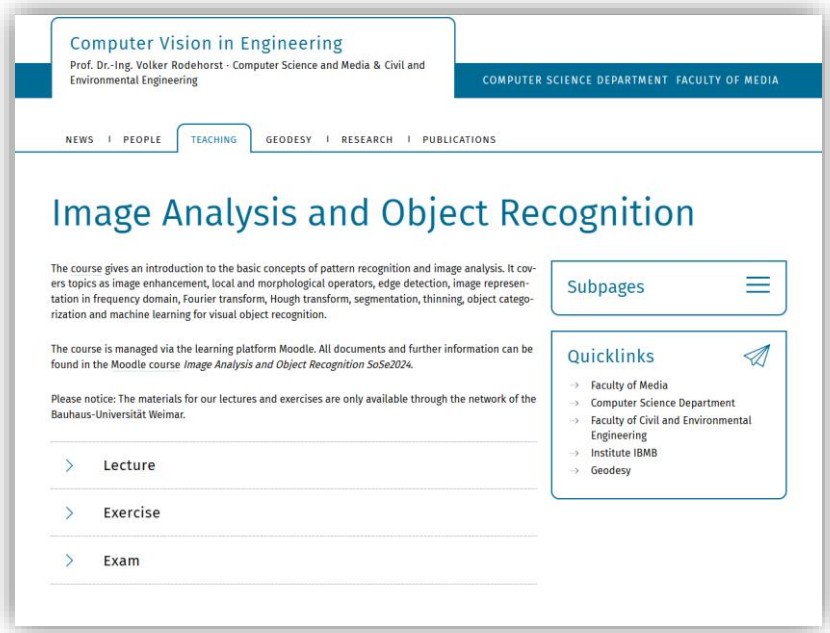
Final project:

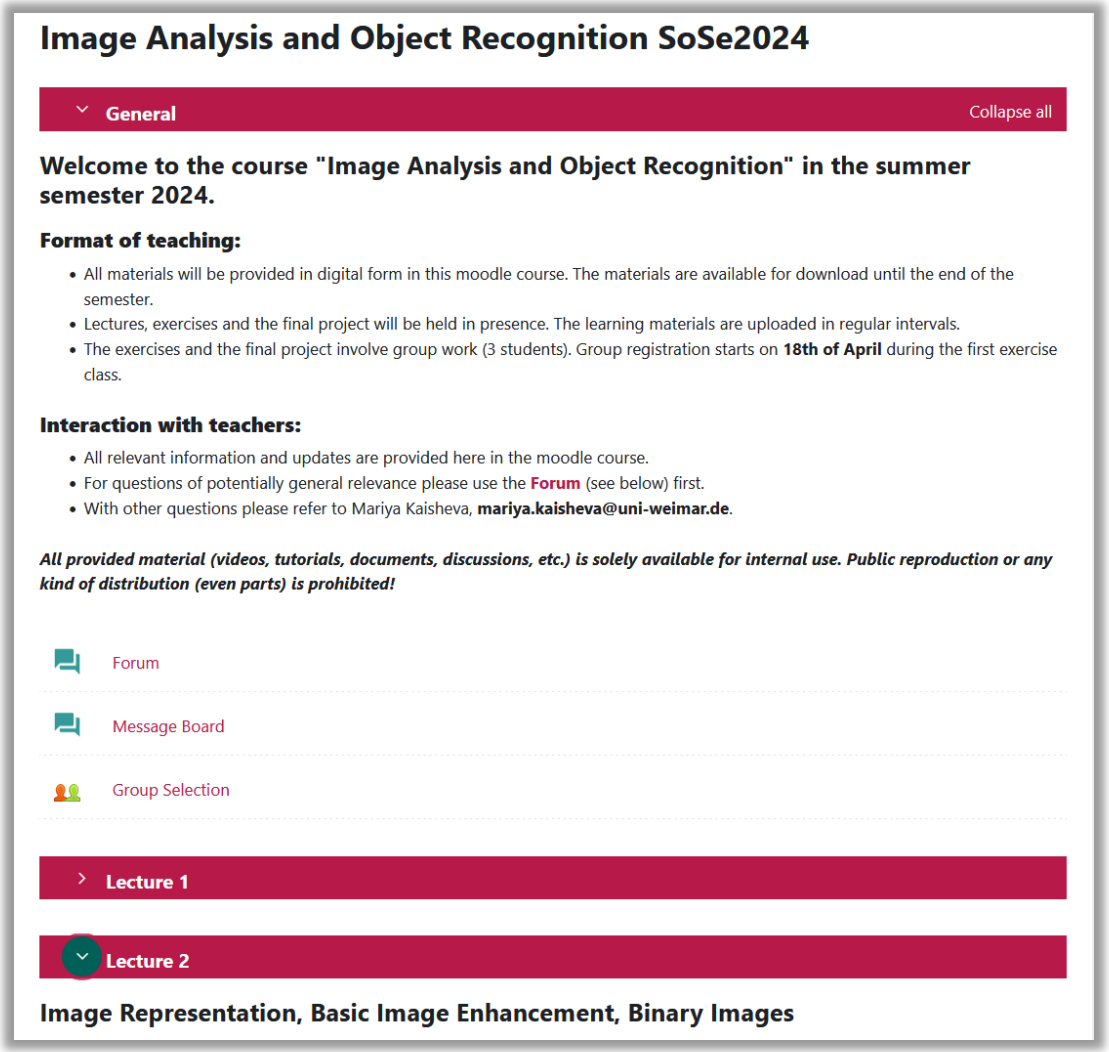
- to be solved in small groups (groups stay the same throughout the semester)
- required for the full completion of the course

General Information

Course materials:

- Moodle
- University webpage





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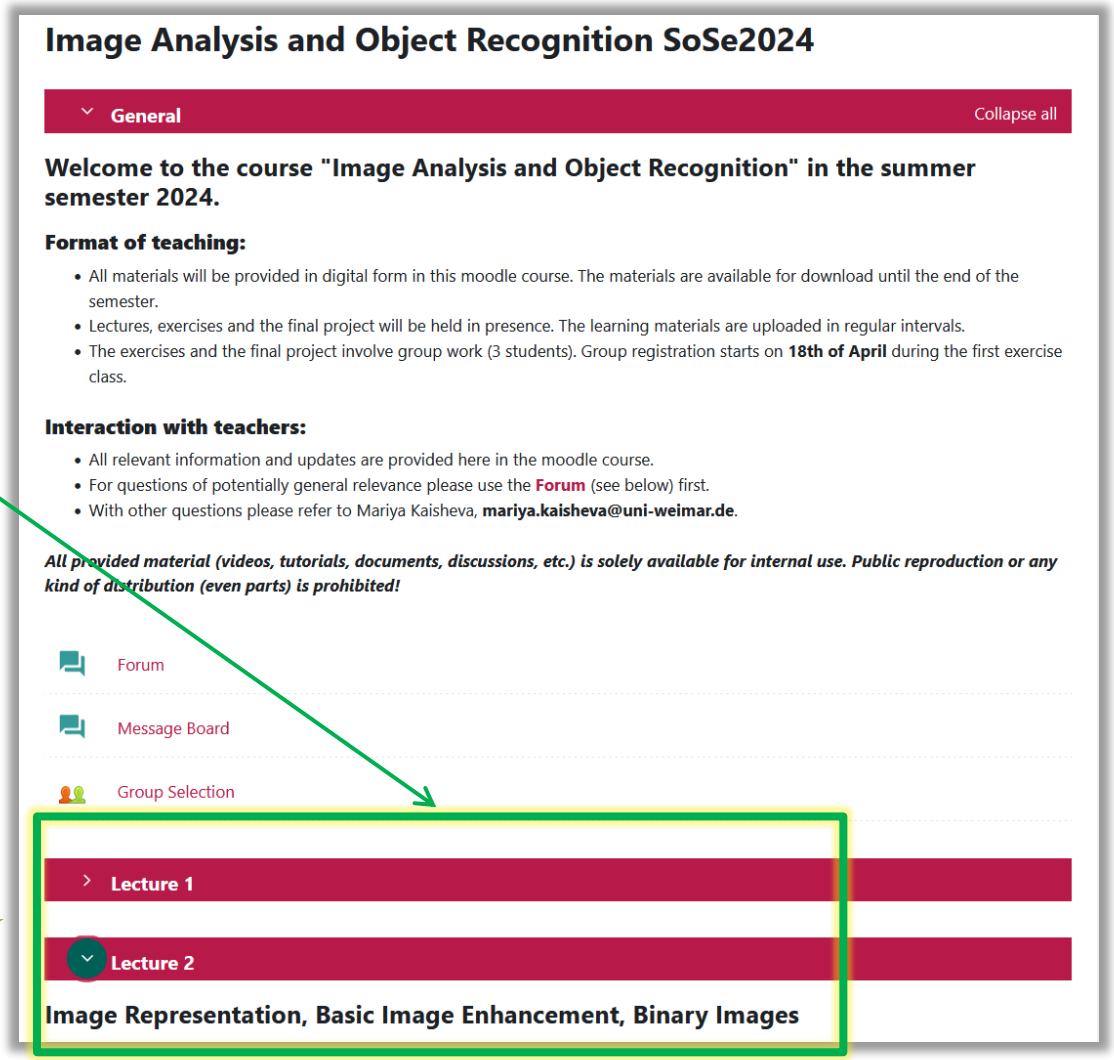
General Information

Course materials on Moodle:

- lecture slides
- exercise class materials
- assignment submissions
- exam preparation materials

learning materials will be uploaded on a regular basis



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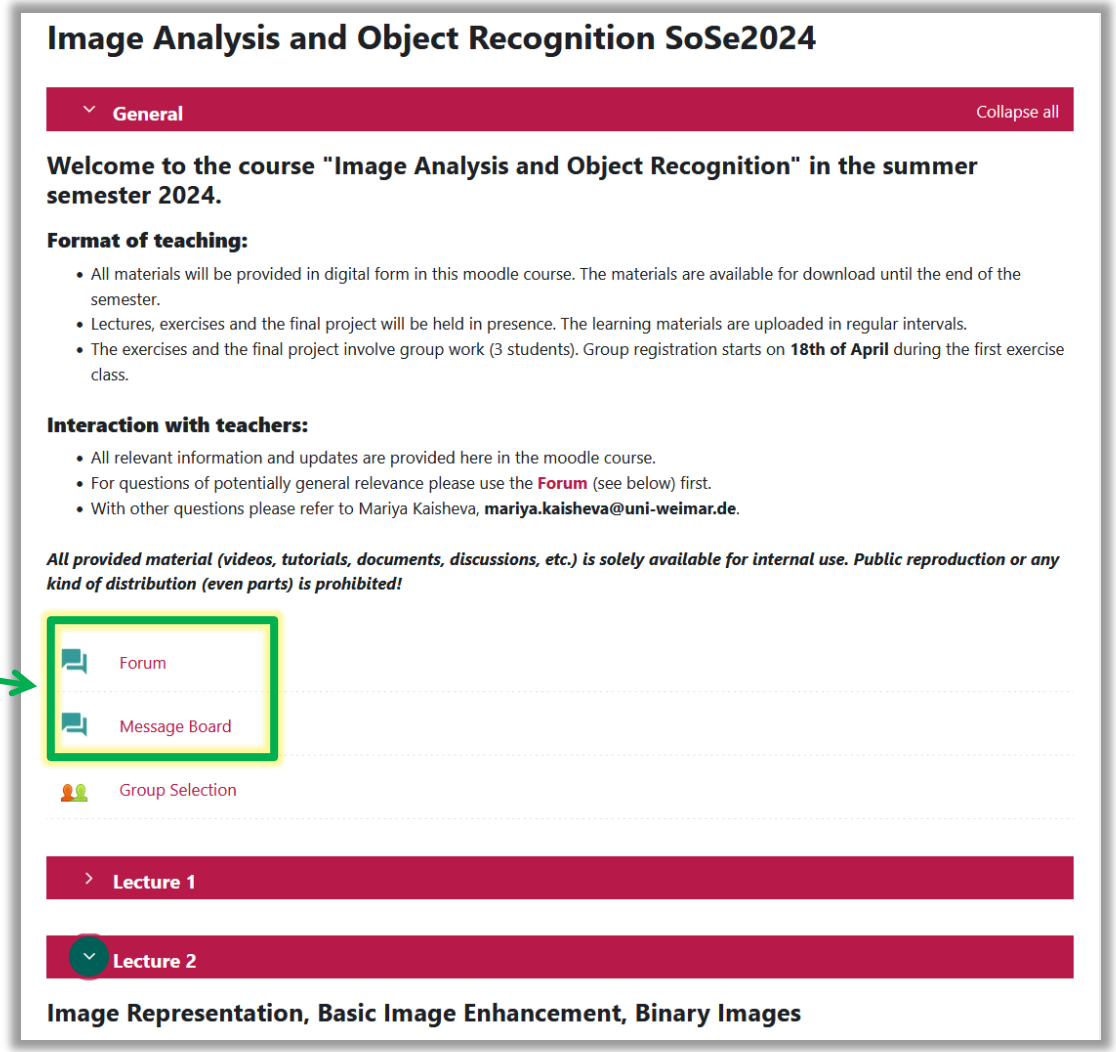
General Information

Course materials on Moodle:

- lecture slides
- exercise class materials
- assignment submissions
- exam preparation materials
- message board
- discussion forum

If you are looking for group members, **use the forum** to inform your classmates.



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Agenda

Topics:

Assignment 1.	Image enhancement, Binarization, Morphological operators
Assignment 2.	Gradient of Gaussian filtering, Förstner interest operator
Assignment 3.	Shape detection based on Hough-voting
Assignment 4.	Filtering in the frequency domain, Fourier descriptors for shape recognition
Assignment 5.	Image segmentation using clustering
Assignment 6.	Convolutional neural networks for image classification
Final Project.	**-** *Will be announced during the last exercise class* **-**

Agenda

Start date and submission deadlines:

Assignment 1.	18.04-24 –	01.05.24
Assignment 2.	02.05.24 –	15.05.24
Assignment 3.	16.05.24 –	29.05.24
Assignment 4.	30.05.24 –	12.06.24
Assignment 5.	13.06.24 –	26.06.24
Assignment 6.	27.06.24 –	10.07.24
Final Project.	11.07.24 –	22.09.24

Wednesday by 23:00
(Central European Time)

Workflow

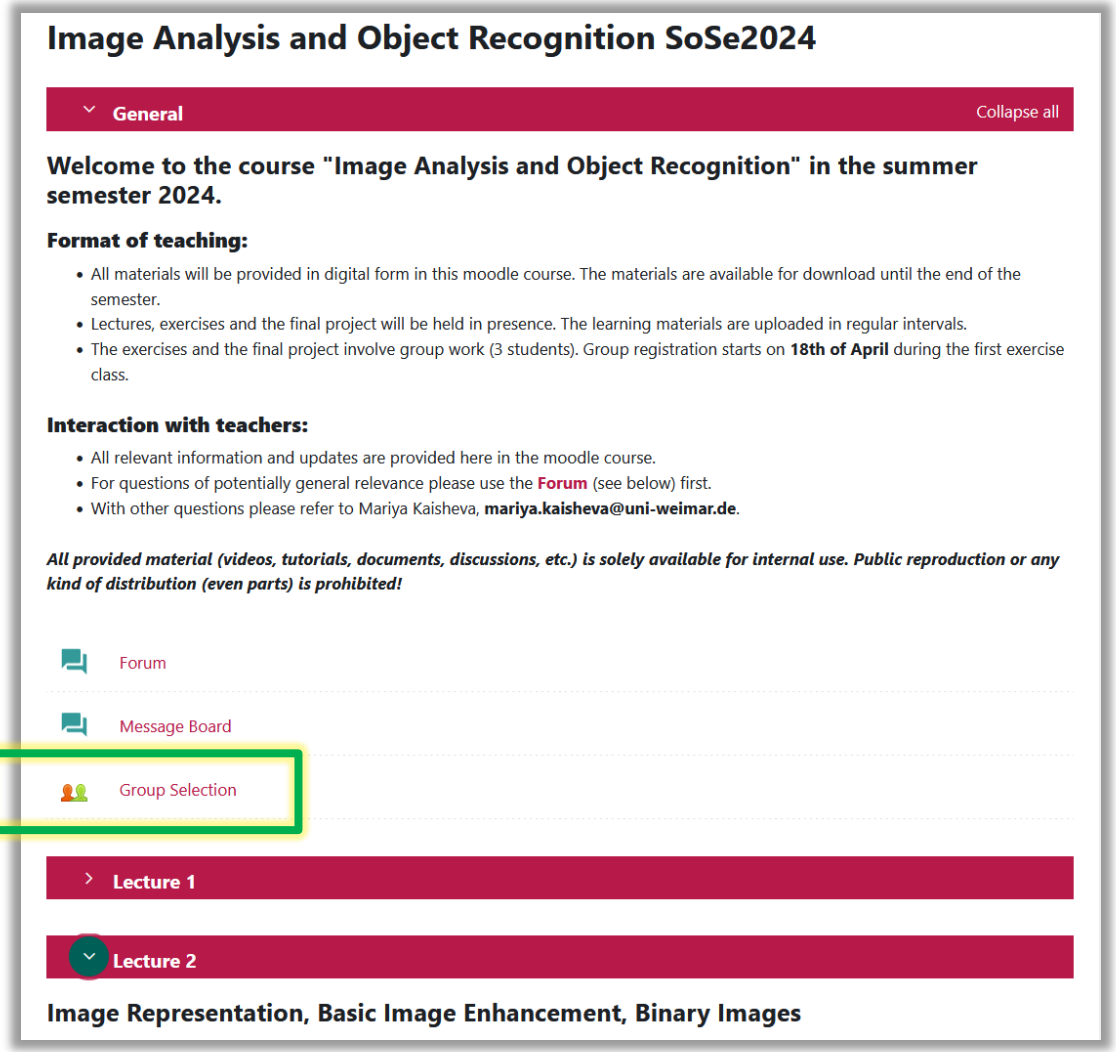
Small groups

- 3 people per group

- group **members stay the same** during the semester

- group selection via Moodle will be possible **until 28th** of April

Disclaimer: All students who have previously completed the assignments, please contact me as soon as possible!



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Workflow

Necessary software

Check the university webpage* for information on MATLAB licences

- licensed product
- installed in the LiNT-Pool (room 2.17 in S143)
- needed for the lab classes:
  image processing toolbox

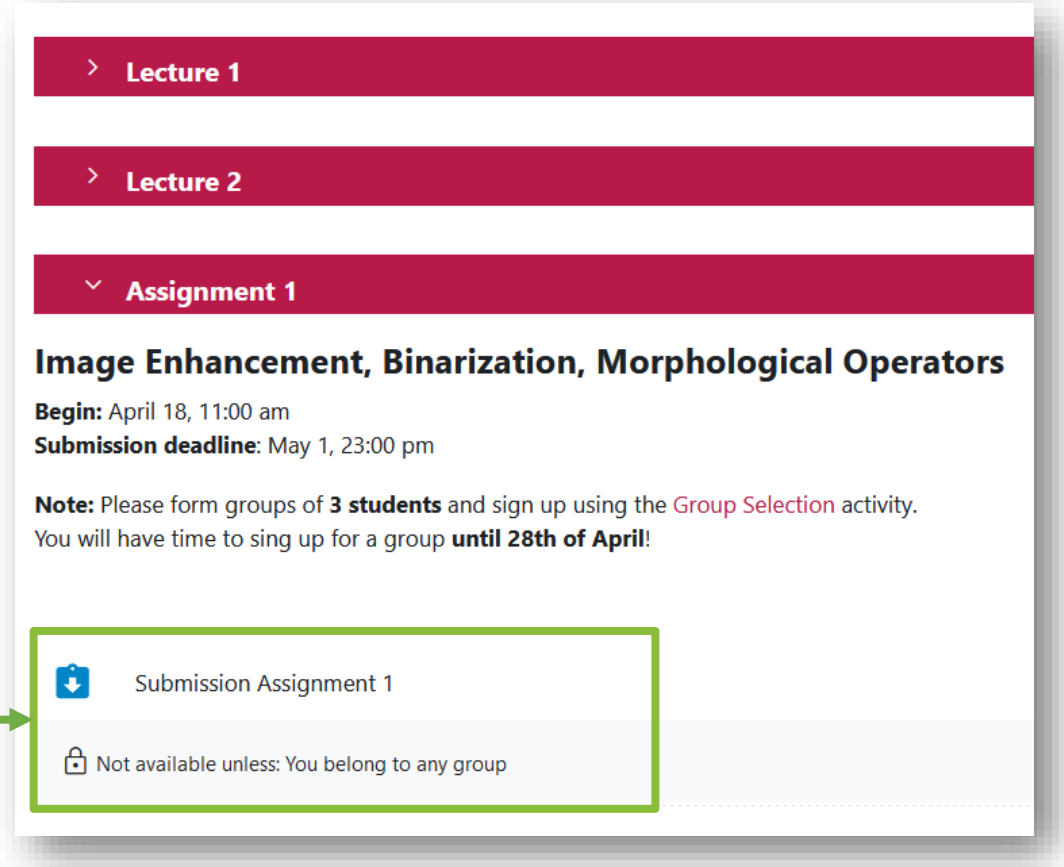
- free software
- required packages:
  general, *control*, *signal*, *image*

* https://www.uni-weimar.de/en/university/structure/central-university-facilities/scc-it-service/study-work-digitally/software/matlab-use-on-private-device/

Workflow

Deliverables

- with each submission provide:
  - well commented source code (*.m files)
  - images used as input (if applicable)
  - short documentation (if applicable)
- upload using Moodle
- only one submission per group needed
- do NOT include personal data like names and student IDs in the submitted code file(s)



Workflow

Assignment evaluation

- no direct effect on the final grade
- exam admission: at least **5 successfully completed assignments**
- grading on a **pass–fail** principle
- successfully acquired exam admission may be preserved (within 5 years time period) until future exam attendance
- plagiarism will be sanctioned ➡ **work independently**