HANDS-ON AI I

**Introductory Information
for Lecture and Exercise**

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materials from Johannes Brandstetter and Jan Schlüter)
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Goals

- Artificial intelligence (AI) is one of the hottest topics in science at the moment.
- This lecture should provide an overview of the milestones of Deep Learning.
- After completing the course, students will be able to:
    - □ understand general machine learning problems
    - □ the transition towards Deep Learning
    - □ the fundamental learning problem
    - □ feed-forward as well as convolutional neural networks
    - □ tricks of the trade concerning the design and training of neural networks
- As the title suggests, the **main focus is put on the interactive learning and understanding of the main ideas** and not on precise mathematical formulations.

Lecture (VL)

- The lecture takes place **from 08:30 to 10:00** (bi-weekly).
- Additionally, a Zoom link is available.
- All students enrolled via KUSSS are automatically enrolled for the Moodle course.
- Videos of the stream are uploaded to Moodle afterwards.
- Please use the Moodle lecture forum for any questions.

Lecture Grading

- Multiple-choice exam via Moodle (info):
  - Exam: **06.02.2023** (topics: entire lecture)
  - Optional retry exam: **27.02.2023** (topics: entire lecture)
  - Optional retry exam 2: **25.09.2023** (topics: entire lecture)
- If you participate in multiple exams, only the most recent one counts, regardless of whether you performed better or worse.
- In order to pass the course, $\geq 50\%$ of all points are required.
- Once you participated in an exam, you will be graded.

Exercise (UE)

- There are multiple bi-weekly exercise groups that take place at **different times and locations** (check KUSSS).
- The exercise **from 10:15 to 11:45 on Monday** is also recorded and the video is uploaded to Moodle afterwards.
- All students enrolled via KUSSS are automatically enrolled for the same Moodle course as the lecture (all groups have access to the same, shared materials).
- Please use the Moodle exercise forum for any questions.

Exercise (UE)

- For the exercises, there is **mandatory presence**.
- Modes:
  - ☐ Physical: signature list
  - ☐ Virtual: Zoom participants list. Ensure that your username is set to **firstname(s) lastname(s)** as shown in KUSSS/Moodle, including your **matriculation ID**. Example: `Andreas Schörgenhumer (k01234567)`
- You are allowed to miss 2 lessons without any reason. If you miss more, you will get a negative grade.
- Exceptions can be made in extraordinary situations, such as illness or a family emergency (a vacation is **not** a valid reason for missing a lesson). Send me a mail in this case.

Exercise Grading

- There will be **7 assignments**, each with 100 points.
- Grading involves all 7 assignments.
- In order to pass the course, $\geq 50\%$ of all achievable points (combined from all 7 assignments) are required.
- One assignment can be skipped/graded with 0 points. If there are two or more assignments with 0 points, you fail the course.
- Once you submitted an assignment, you will be graded.

Exercise Assignment Submission

■ Please hand in the homework via Moodle.

■ Assignments will be based on **Python Jupyter Notebooks**.

■ Unless specifically instructed otherwise, only submission of Python Jupyter Notebooks is accepted.

■ File name conventions:

    ☐ Un_Assignment.ipynb (n is the number of the assignment)

    ☐ Example: U1_Assignment.ipynb

Grades VL + UE

Points	Grade
$\geq 87.5\%$	(1) Sehr Gut
$\geq 75\%$ and $< 87.5\%$	(2) Gut
$\geq 62.5\%$ and $< 75\%$	(3) Befriedigend
$\geq 50\%$ and $< 62.5\%$	(4) Genügend
$< 50\%$	(5) Nicht Genügend

Outline

For the schedule, always check both KUSSS and Moodle.

Unit 1: Running Your First Notebooks, Tabular Data

Unit 2: Reading, Handling and Visualization of Datasets

Unit 3: Working With Datasets

Unit 4: Logistic Regression as a Door Opener to Deep Learning

Unit 5: Your First Neural Networks

Unit 6: Convolutional Neural Networks

Unit 7: Tricks of the Trade