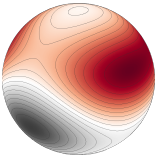
UNIVERSITÄT
HEIDELBERG
ZUKUNFT
SEIT 1386

IWR
Interdisciplinary Center
for Scientific Computing



Organizational Meeting
Seminar: Mathematical Machine Learning

Winter Semester 2022/23

Welcome

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General

- Language: English
- Intended for Master students (and senior Bachelor students)

Concept of a Seminar

- Conduct independent research on a scientific topic.
- Start from a given source and explore further resources.
- Present your findings and include references.
- Adjust the presentation to your audience.
- Do not copy from sources, but explain in your own words, add examples, etc.

Grading

- 45 minute presentation (50%)
- written documentation (30%)
  - Master students: 10-15 pages
  - Bachelor students: 5-10 pages
  - maximum 15 pages
- participation in class (20%)

Timeline

- Today: Distribution of topics

  Accepting a topic is the binding registration for the seminar.
- Starting second week of January: weekly meetings à 2 hours
- two presentations per meeting
- in order of the topics list
- weekday and time: **Mondays 11am - 1pm**

Topics

1. Introduction Machine Learning I
2. Introduction Machine Learning II
3. Feed Forward Network
4. ResNet
5. Convolutional Network
6. Recurrent Neural Network
7. Long Short Term Memory Network
8. Auto Encoder
9. Fractional-DNN
10. Physics Informed Neural Network

Mandatory

- (at least) 1 week before your presentation:
  appointment for feedback
  presentation and documentation need to be prepared

- (at least) 24 hours before your presentation:
  submit your documentation
  (will be handed out)

What's next?

- Resources are online: https://scoop.iwr.uni-heidelberg.de/teaching/2022ws/seminar-mathematical-machine-learning/
- These slides will be shared on the website.
- We provide LaTeX templates for your presentation and documentation.

Questions?