



Seminar SS 2018

Machine Learning and Artificial Neural Networks in Biomedical Applications



Milestones

- **Today:** kick-off meeting
 - General information
 - Presentation of topics
 - Choose your topics
 - First meeting with supervisor



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 - Presentation of topics
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- May 31th: outlines of presentation and written report

- June 22th: first version of report, and optional rehearsal presentation

- July 13th, 20th (Fridays) : presentation sessions

- August 3th: final written report

Deadlines are mandatory!

Presentation sessions
13.07. 10:15 c.t. – 13
20.07. 10:15 c.t. – 13



What we expect

- Overall object: learn scientific/academic workflow
- Work independently **20 %**
 - Research your topic
 - Find, read and understand relevant papers
 - Select what to present
- Regularly meet with your supervisors, they'll help you
- Written report **30 %**
 - English, scientific style, 15-20 pages, Latex template
 - draft – feedback – final version
- Presentation **50 %**
 - English, 20 minutes + 10 minutes discussion
 - Content, form, presentation skills



What you have to do

- We provide you with 1 or 2 papers to start
- Do your own research
 - Find and understand other papers, which are important for your topic.
 - What is the background?
 - What other papers are there, which are relevant for your topic



How to find important information

- Wikipedia and internet in general can be a good start for basic information
 - But be careful
 - Should not be cited
 - Better find some scientific papers
- „Google Scholar“ is good for finding scientific papers
 - You can access most papers from the university network
 - If you cannot access it directly, search for it elsewhere: Researchgate, authors homepage, ...



How to present your topic in the report

- Do not copy/paste
- The goal is not to rewrite a paper in your own words
- Provide the background necessary to understand your topic
- Present your topic: What information is important? What not?
- Discuss your topic: pros and cons. Where is it going? What do you think about it?
- Proper citations: cite, where you got your information from. Do not copy citations, only cite, what you have read and used for your report



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No Plagiarism! Don't cheat!

Student submission:

Nevertheless, artificial intelligence showed that, nowadays, robots and machines have problems even remotely approaching human perceptual possibilities, apart from some highly domain-specific scenarios.

Original paper:

However, artificial intelligence has shown that, apart from some highly domain-specific scenarios, to this day, machines and robots have difficulties even remotely approaching human perceptual abilities.



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Use your own words!



Topics

1. Gaussian Process Regression for Predictive But Interpretable Machine Learning Models: Predicting mental workload
2. Adaptive Automation Triggered by EEG-Based Mental Workload Index: A passive BCI application for Air Traffic Control
3. Classification of the cardiocotogram data for anticipation of fetal risks using machine learning techniques
4. An efficient word typing P300-BCI system using a modified T9 interface and random forest classifier
5. Exploring Combinations of Different Color and Facial Expression Stimuli for Gaze-Independent BCIs
6. Simultaneous control of multi-DOF prostheses
7. Decoding language with high-density ECoG grids