

Seminar:

Advanced topics in Machine Learning

Prof. Joachim Buhmann
Prof. Thomas Hofmann
Prof. Andreas Krause
Prof. Gunnar Rätsch

Goal of this seminar course

Practice giving scientific presentations

Learn about advanced topics in
machine learning

Goal of today

- Seminar topics overview
 - ~40 papers in 10 topic areas
- Assignment of students to these topics
 - Detailed assignment of papers done later
- Discuss course organization, grading

Course organization

- Two time slots:
 - Tuesday 16-18 in CAB H52
 - **Thursday 16-18 in CAB G57**
- You are expected to **present** in and **regularly attend** one of these slots
 - n sessions per slot (probably, ~10) with 2 talks each
 - You **must attend n-1** sessions in the slot you're presenting.
 - You may switch between slots in one week.
- First talks will start on 5. or 12. October

Grading

- Your grade will be determined based on your talk, as well as participation in the discussion
- Criteria:
 - **Structure** (how well is your talk organized?)
 - **Understandability** (how understandable is your oral presentation and slide design?)
 - **Completeness** (how well do you provide right background, and manage to focus on what is important and relevant?)
 - **Engagement** (how engaged are you in class and in the talk preparation?)
 - **Independence** (how independent are you in preparing the presentation, and in reflecting on the paper?)

Presentation details

- Use **electronic slides** (ppt, pdf, ...)
- Talk length: **30 min** + 15 min discussion
- The talk should provide **sufficient background** to be understandable to someone who has taken an ML class
- You should present the **papers contributions and results**, as well as **reflect** on them

Typical talk outline

- **Introduction** (Motivation and background)
- **Formal problem statement** (Notation, ...)
- **Technical contribution** (algorithm, theoretical result, ...)
- **Experimental results** (if any)
- **Discussion** (what are perceived strengths and weaknesses of the paper; what could be done more; ...)
- **Conclusion**

Advice on presentation design

- Giving compelling presentations is hard!
 - „Minimize words and maximize illustrations“
 - Focus on giving intuition, identifying key insights etc.
- Some pieces of advice:
 - <http://www.cs.berkeley.edu/~jrs/speaking.html>
 - <http://research.microsoft.com/en-us/um/people/simonpj/papers/giving-a-talk/giving-a-talk.htm>
 - <http://greatresearch.org/2013/10/04/presenting-a-technical-talk/>

Topic assignment

- We will introduce a set of topics for Thursday
- Each student gives ordered preferences for 3 topics
- We match students to topics according to preference
- Each topic will have a representative, who will assign papers from the topic to students
- For each paper, there will be an advisor whom you can ask for clarification and advice
- Set up **at least one** meeting with your advisor to discuss the paper / presentation (weeks before talk)
- Send **(near-complete) draft** of slides to advisor **at least 7 days** prior to presentation date

Topics: Thursday

- Deep Reinforcement Learning (RL)
- Uncertainty in Deep Learning (UDL)
- Theory of Deep Learning (TDL)
- Generative Modeling (GM)
- Societal aspects of machine learning (SML)