

Seminar Digital Communications 389.171

Topics & Technicalities / WS2020/21

Norbert Goertz & Georg Pichler

{norbert.goertz, georg.pichler}@tuwien.ac.at

<http://www.nt.tuwien.ac.at>



Technicalities

- Topics by mutual agreement from list given below
- Students will
 - start on a topic with some introductory references
 - find more advanced literature and identify key papers
 - understand principles, methods and potential applications
 - give presentations (25mins + 5mins discussion); talks & slides in English
 - possibly do some Matlab/C-Programming if required for the topic
- Deliverables: talks, presentation slides, Matlab/C-code (if applicable)
- Dates for presentations: **from December 2020 by mutual agreement / all by web-meetings**
- Seminar participants should attend all talks and engage in discussions
- Students should investigate more details of the topics on their own to find out what they like most
 - ➔ ranked list of 3 preferred topics by email to norbert.goertz@tuwien.ac.at
 - ➔ **deadline for email: 22 Nov. 2020**
- Topics will be allocated shortly after the deadline.
- Students can try to choose later, but then their topics of choice may be gone.

Topics in WS2020/21

Theme “Machine Learning in Communications”

Topics for the seminar can be selected from the extensive list of papers posted at

<https://www.comsoc.org/publications/best-readings/machine-learning-communications>

- There is a variety of publications on the comsoc-website which includes very specific as well as tutorial-style papers.
- If an application-specific topic is selected, a general discussion of the theoretical foundations of the algorithms used as well as the specific details of the application are expected for the talks.
- Focus should not be on the one selected publication alone but rather on the topic, so additional material should be considered as well.
- Proposals for specific topics shall be discussed with lecturers of the course.

The following specific topics on Outlier Detection and Bayesian Neural Nets can also be selected:

<https://arxiv.org/abs/1912.03263>

<http://papers.nips.cc/paper/>

[9547-can-you-trust-your-models-uncertainty-evaluating-predictive-uncertainty-under-dataset-shift.pdf](#)

The following general approaches to statistical inference can also be selected as seminar topics:

- Expectation Consistent Approximate Inference

<http://jmlr.org/papers/volume6/opper05a/opper05a.pdf>

<https://arxiv.org/pdf/1602.07795.pdf>

- Variational Inference

<https://arxiv.org/pdf/1601.00670.pdf>

<https://www.youtube.com/watch?v=Dv86zdWjJKQ> (from 7:40)