PROGRAMMING IN PYTHON II

Literature Research – Resources

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First ML Project Steps

- Typically your ML project will roughly start as follows:
  - Meeting to discuss goals of project with parties involved
  - Meeting to get overview over existing data, if any
  - Meeting to get overview over existing hardware/software/budget
- Now that you have an overview regarding the task, it's time to look for possible solutions

$\rightarrow$ **Literature research!**

Literature Research – Start

- Always look into the current state of research!
- The field of ML is advancing rapidly and you will/should be overwhelmed by the amount of publications
- Start by getting an overview:
  - Do an initial search to get first impressions and keywords
  - Talk to (non-ML) experts in the field of the data/task to get a list of potential research fields and different naming conventions
  - Especially in research: Talk to your supervisor and colleagues to get names of fields, authors, conferences, journals – use their experience!
  - Be aware of research “bubbles” and biases!

Literature Research – Resources (1)

- Books
  - Standard works, e.g., Pattern Recognition And Machine Learning (Bishop), are preferred references
- Conferences and Journals
  - Conferences (NeurIPS, ICML, ICLR) have a higher status than in other scientific fields
  - Reviewed and high quality
- Relevant publications
  - Check the bibliography, someone may have already done a literature research for you (but might be biased)

Literature Research – Resources (2)

- https://arxiv.org/ – Pre-print publications
  - Not all peer-reviewed, be careful!
  - Lots of scientific fields, including different categories directly concerning ML
- https://scholar.google.com/ – Search engine for publications
  - Good for looking up authors, papers, books, topics
  - Good source for citation information
- https://github.com/
  - Main resource for published code, baseline implementations, benchmarks
  - Typically not reviewed, often unofficial – be careful!

Literature Research – Resources (3)

- https://www.reddit.com/r/MachineLearning/, wikis, blogs, twitter, ...
  - Good to get an overview/introduction
  - Sometimes good for benchmarks but often biased
  - Not reviewed, often not by original authors, often very shallow
  - Nice complimentary material but no replacement for actual publications
- https://data.stackexchange.com/
  - Wide range of topics (programming, mathematics, statistical analysis, ...)
  - Great source of problem-specific questions and (hopefully) answers
  - Similarly, not reviewed, so be careful

Literature Research – Caution!

- Too many submissions, not enough reviewers $\rightarrow$ decreasing quality of publications
- Check if scientific standards were violated
- Keep biases and bubbles in mind
- Do not blindly trust code/solutions/claims/etc. you find on the Internet