

PROGRAMMING IN PYTHON II

Literature Research – Resources



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Outline

- 1. First ML Project Steps**
- 2. Literature Research – Start**
- 3. Literature Research – Resources**
- 4. Literature Research – Caution!**

First ML Project Steps

- Typically your ML project will roughly start as follows:
 1. Meeting to discuss goals of project with parties involved
 2. Meeting to get overview over existing data, if any
 3. 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
- 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 a google-search to get first impression 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

- ☐ Yes, they do exist and are important
- ☐ Standard works, e.g. Pattern Recognition And Machine Learning (Bishop), are preferred references

■ Lecture Materials

■ Conferences and Journals

- ☐ Conferences (NeurIPS, ICML, ICLR) have a higher status than in other scientific fields
- ☐ Medium of publication depends on field
- ☐ Reviewed and high quality

■ Relevant publications

- ☐ Check the bibliography, someone already did 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
 - 30-100 new publications per day
- <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

Literature Research – Caution!

■ Finally, a word of caution:

- ☐ Too many submissions, not enough reviewers → decreasing quality of publications
- ☐ Check if scientific standards were violated
- ☐ Keep biases and bubbles in mind
- ☐ Do not blindly trust code you find on the internet