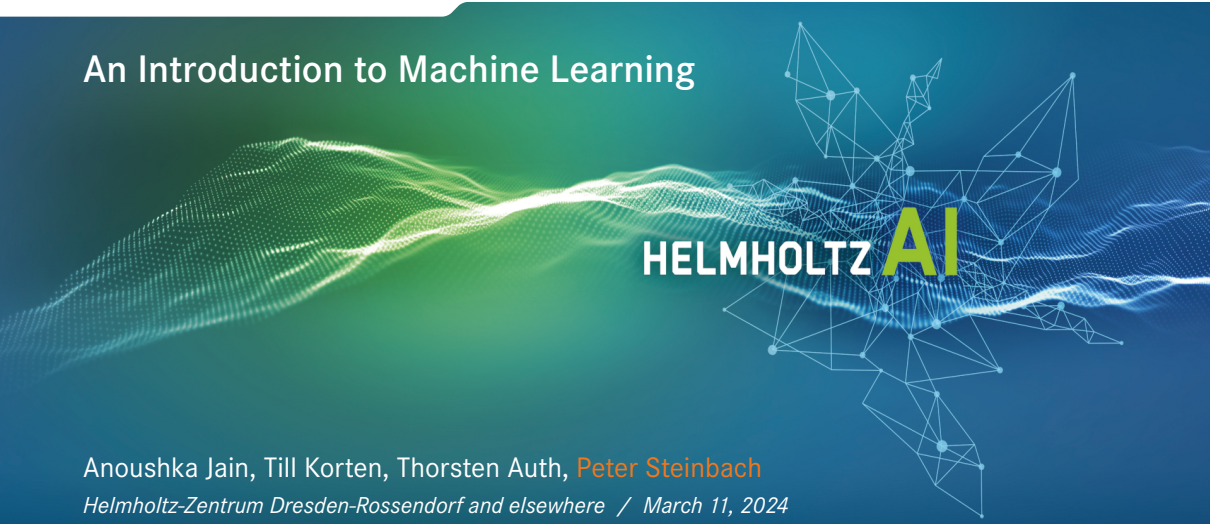
An Introduction to Machine Learning



Anoushka Jain, Till Korten, Thorsten Auth, Peter Steinbach

Helmholtz-Zentrum Dresden-Rossendorf and elsewhere / March 11, 2024

Teaching to the Median

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- **content serving the majority of learners:**
  - concepts
  - pipelines
  - metrics

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How well you do is determined by how 'aligned' your learning algorithm $P(f_{pred}|data)$ is with the actual posterior, $P(f_{true}|data)$. "

Modern (Teaching) Challenges

- content for 3 - 4 days (essential vs. important)
- slidedecks won't cut it (learner speed)
- zoom fatigue

Adopted Flipped Classroom

status quo

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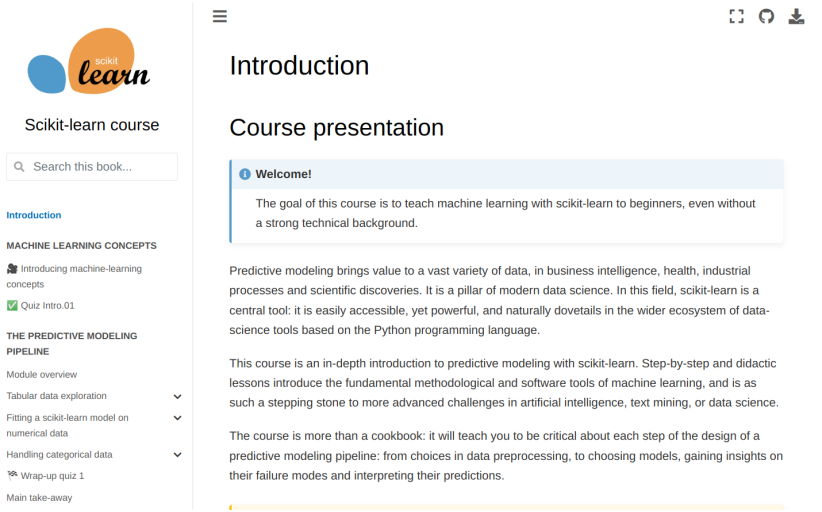
- **learner performs exercises in group**
  (reinforces with mentor)

Machine learning in Python with scikit-learn MOOC



Course Setup and Timetable

- Split audience into **teams of up to approx 10 learners** (*2 mentor(s) per team*)
- teams walk through modules of learning material **independently**
- learning modules: **jupyter notebooks and prerecorded videos** (on-premise jupyter service, mybinder, google colab)

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09:00 all-hands good morning (feedback from last day)

09:15 split into teams (rinse and repeat)

- learners **study notebooks** autonomously
- mentor polls team to rejoin (or for more time)
- **general discussion** on the video
- learners conduct **exercises**

16:15 general questions and feedback

16:30 good bye

Evidences for different learning speeds

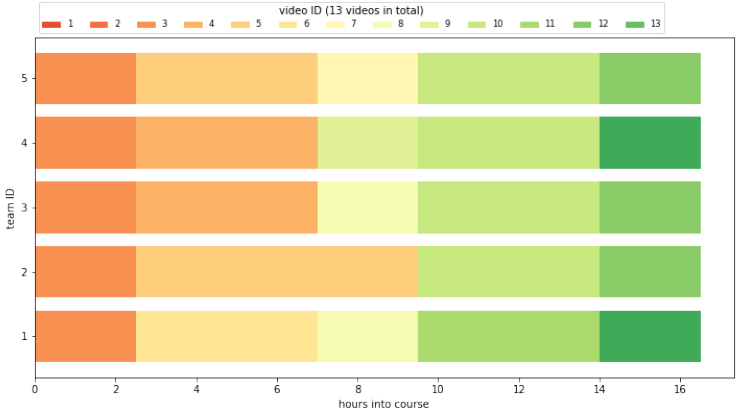

Figure: Use of videos of five teams across the course duration (hours into course). Teams expose different learning speeds.

Learner Assessment

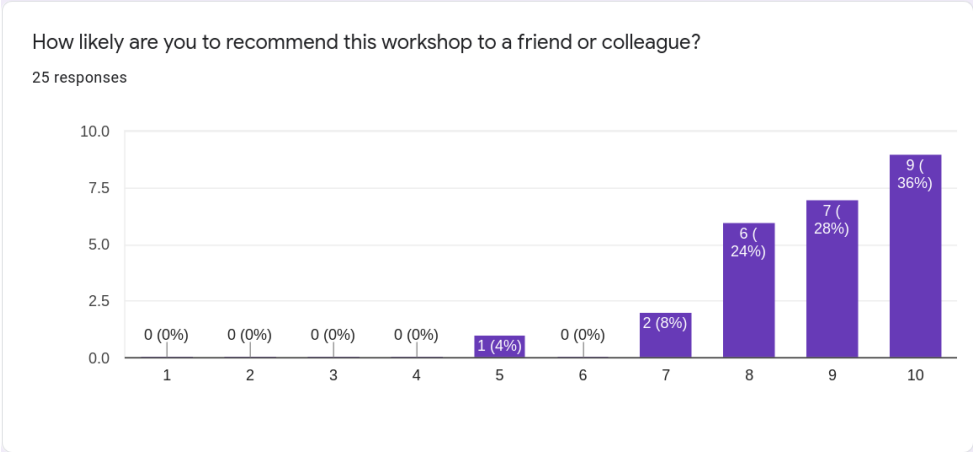

Figure: Net Promoter Score: results from Oct 2021 GSI workshop survey, 25/36 learners replied

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Notebooks

If you can, work through the notebooks on your local laptop. A backup solution is described on the central learner pad.

To all mentors ...

Thank you!

(especially given the chaotic preparation)

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- virtual “flipped” classroom approach

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Have fun learning together!