Elements of Machine Learning & Data Science

Winter semester 2023/24

Automated Machine Learning (2)

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Key questions:

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Preparation for today:

Read the following research paper:

Oded Maron and Andrew Moore: Hoeffding Races: Accelerating Model Selection Search for Classification and Function Approximation. Advances in Neural Information Processing Systems 6 (NIPS 1993): 59-66, 1993.
(The paper is available online at https://proceedings.neurips.cc.)

Focus on the following questions (which will be further explored in TPS exercises in class):

(1) What is the fundamental problem when using cross-validation
        (or performance on a validation set) to select between different ML models?
(2) What is the key idea behind Hoeffding races and how does it address the problem
        identified in (1)?
(3) What is the role of the parameters Δ and δ, respectively?

Bring your answers to these questions (which can be in the form of bullet points) to class;
they will be the basis for TSP exercises).

NB: Full understanding of the proof in Section 3 is desirable but not essential.

TPS Exercise (T part = done as homework)

Question:

How to assess predictive models for <u>multi-class classification</u>?
(> 2 target classes, e.g., on time, mildly delayed, severely delayed)

TPS Exercise

You have used supervised ML to train a predictive model for a binary classification problem. The model gives you a numerical prediction score between 0 and 1.

Question:

How to assess the quality of the model?

Key concepts covered today:

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