

Automation of Machine Learning Workflows



Motivation

The digitalization of society is one of the most important current developments, which results in the generation of rapidly growing data streams. For extracting useful information from such data, Machine learning (ML) approaches are increasingly used since the data is too dynamic and too large for conventional, hypothesis-based analyses.

A steadily growing number of machine learning methods and processes are available to develop ML solutions, which require decisions on design and parameter settings. ML experts therefore face the following challenges:

- No-Free-Lunch Theorem: There is no “best” method and therefore no best ML workflow that suits every situation
- Inductive Bias: In case of an unknown distribution of the data, making a reliable statement about the performance of a ML procedure is hardly possible.
- Knowledge gap: Given the data, for many established ML-procedures it is unclear, under which conditions a good performance can be expected.

CODA Solution

The CODA project deals with basic research on the automation of algorithm selection and hyper parameter optimization in the development process of machine learning solutions. The findings and solutions are available in the form of a software framework, allowing users to focus on the remaining creative aspects of development.

PROJECT OVERVIEW

PROJECT TITLE

CODA - Cognitive Data Analytics Framework

WHAT IS IT ABOUT?

CODA project conducts research on algorithm selection and hyper parameter optimization in machine learning workflows. The main objective of the project is to develop a prototypical software framework that partially automates the development process of ML solutions.

RUN-TIME

from 2017/01/01 to 2019/12/31

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BUZZWORDS

Machine learning, Meta learning, Hyperparameter optimization, Model selection, Big data, Smart data, Data analytics

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