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Fachgebiet AOT
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Bachelorthesis proposal

Sparked, an intuitive user interface for the
automated machine learning project CODA

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1 Motivation

With the ongoing digitalisation and the generation of big data in most aspects of society, data driven approaches to every day problems become more and more viable. One way to evaluate these large datasets is with an machine learning approach. Machine learning, though powerfull is not a wonder box. Not every machine learning approach is applicable for every problem and not every algorithm will perform in reasonable time on every data.

You need a lot of intimate knowledge and intuition about machine learning algorithms to select a good approach to your given problem. Knowledge and intuition that is only developed in few experts. Even then, to optimize for a given problem still requires a lot of trial and error, as most of the time the best hyperparameter settings can only be found by trial and error.

To find a way to automate this process, DAI-Labor (Distributed Artificial Intelligence) and GTARC (German Turkish Advanced Research Center for ICT) have started CODA, a fundamental resarch project in algorithm selection and hyperparameter optimisation. (PROJEKTSTECKBRIEF!)

With this project, nicknamed Sparked, we create an interface to the CODA project, allowing machine learning enthusiasts and specialists to use the developed solutions and giving the CODA team an interface to demonstrate CODAs capabilities.

As such we will provide a user interface that is usable in demonstrations and can be used by persons with a background in machine learning without prior training. As such a focus is set on a clean workflow, good user guidance and a visual appealing display.

2 Objective

Create a web application and a supporting backend to interface with the CODA backend.

The project is roughly separated in NNNNN parts:

- Architecture
- Development
- Evaluation

2.1 Architecture

To develop Sparked an architecture has to be chosen. This includes which technologies will be used in the development process.

The architecture has to support several criteria:

- Demonstration startup
It should be easy to spin up a clean Sparked instance with clean databases for demonstration purposes. Sensible defaults should apply, to make such an instance immediately usable even by an untrained individual.
- Configurability
Changing the CODA Backend should be possible without recompile.
- Docker deployment
Sparked has to run in docker containers on a linux system.

Some common characteristics of web applications are not relevant and can be ignored:

- Useraccounts
All Users will operate on the same data. There will not be any useraccounts, any data uploaded to Sparked is visible to any other user.
- Login
The UI will be open and not contain any login features or any other form of access controll.

2.2 Development

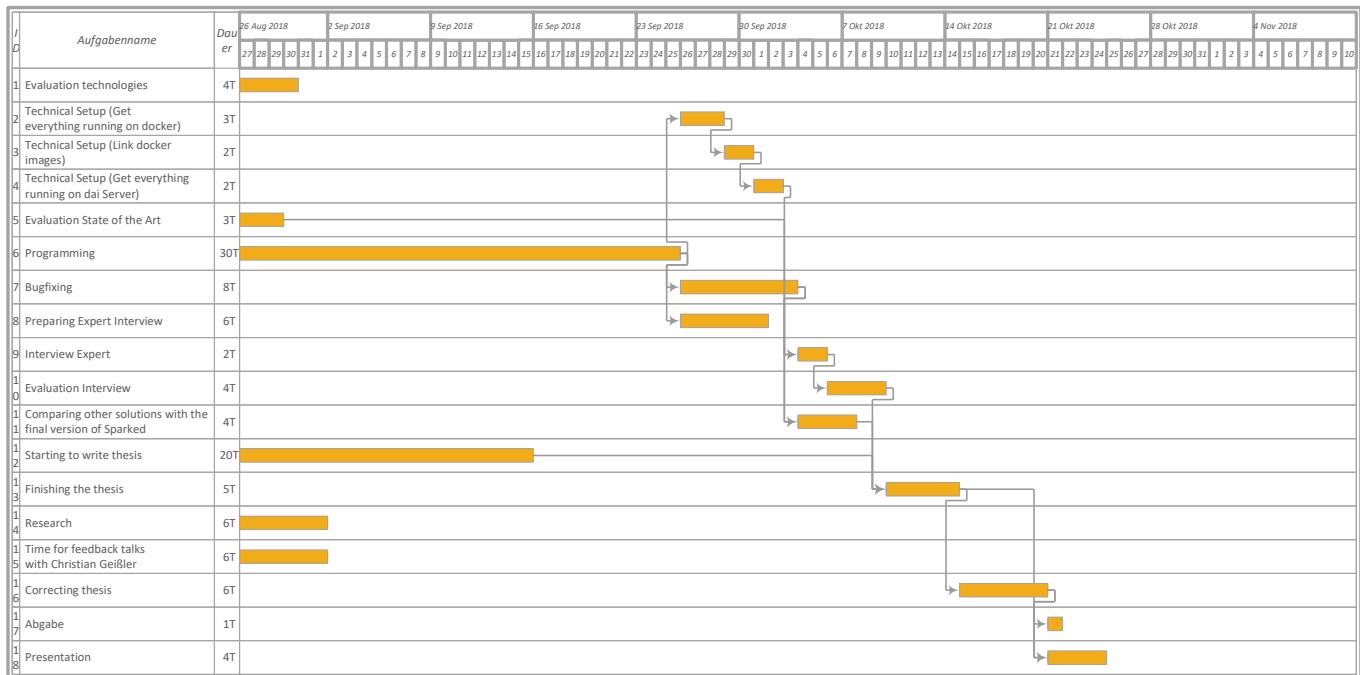
2.3 Evaluation

- Architecture
 - Evaluate and select the languages and technologies for this project
- Development
 - Let the user create Orders and save them
 - Create the tasks that need to run in order to evaluate an order
 - Display all Orders, to show their progress and to stop, pause and unpause them
 - Receive and display the result of the tasks.
- Evaluation
 - interview
- lol?

3 Work packages

- Evaluating technologies
 - Diplay graphs

Sparked time plan

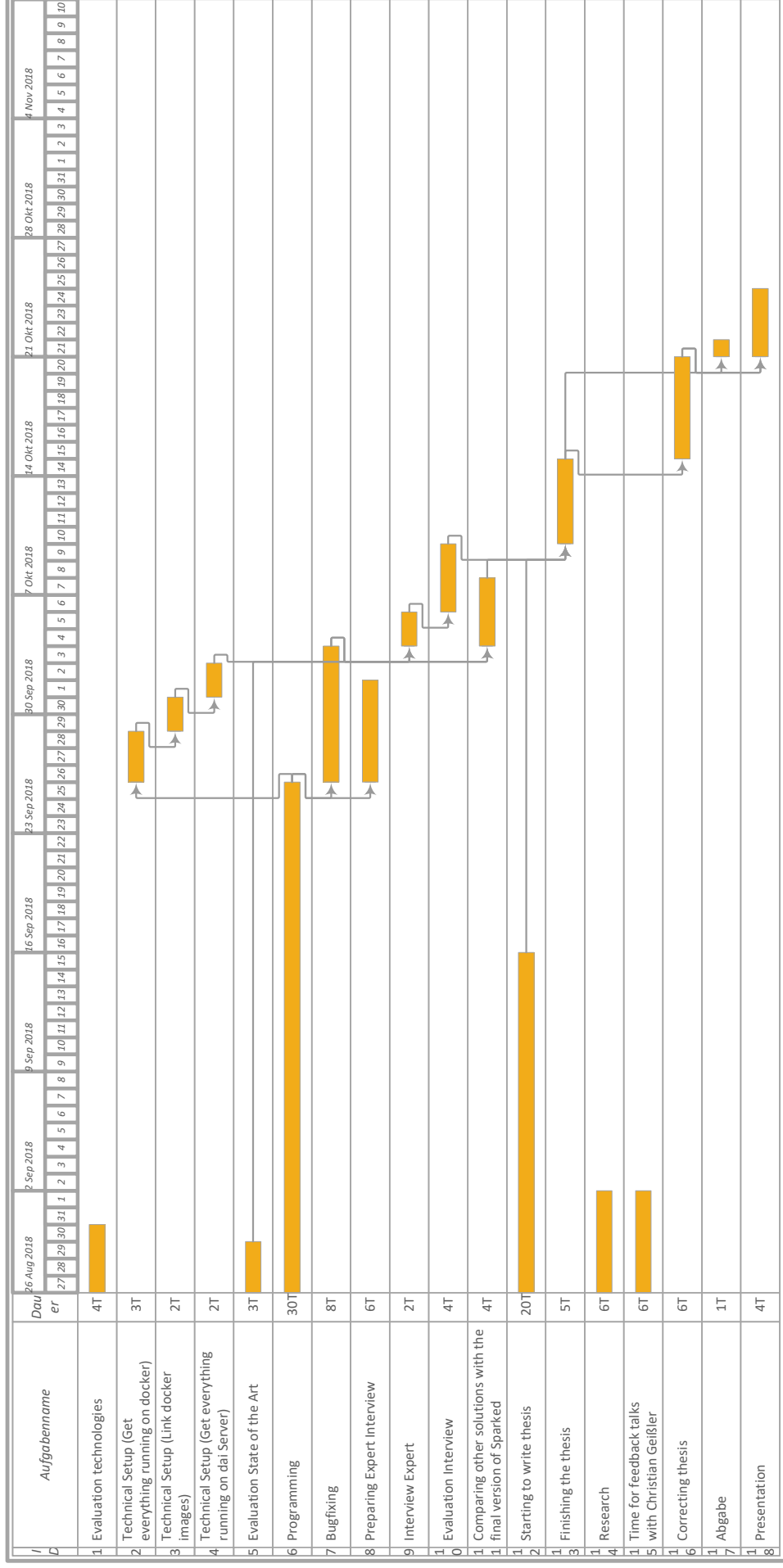


4 Organizational

- Language of this Bachelorthesis is english.
- The thesis will be written with pdf_latex.
- Choosing programming languages and technologies are not defined and part of the development process.
- Supervisors is Christian Geißler
- Evaluators are Prof. Dr. Albayrak and Prof. Kao **inproceedings**

5 Appendix

Sparked time plan



Literatur

Nielsen u. a.: Getting Access to What Goes on in People's Heads? Reflections on the Think-aloud Technique Nielsen:2002:GAG:572020.572033

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