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Bachelorthesis proposal

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

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Contents

1	Motivation	2
2	Objective	3
3	Work packages	4
4	Schedule	5
5	Organizational	6
6	Appendix	7

1 Motivation

With the project CODA GT-ARC is doing fundamental research in automisation of selecting algorithms and hyperparameteroptimisation in the creation of of solutions in machine learning (taken from CODA Projektsteckbrief ... REMINDER: create bibentry).

Sparked builds on top of that, trying to give machine learning specialists and enthusiasts a clear and easy to use interface to interact with the current and future versions of the CODA project. Allowing the user to upload their own data, selecting out of the ever growing number of evaluation methods and metrics, to pick a classifier and select its parameters or request CODA to find the best parameters automatically and display the results in a visually appealing way, that allows for easy visibility of the wanted information.

With this Sparked becomes the face for the research done in CODA, to quickly demonstrate its capabilities or allow the informed user to test their own.

2 Objective

- visually appealing [very opinion based]
- display interesting data in an easy to find way [very opinion maybe a list of information that is of interest for the user and an evaluation how many clicks/scrolls they need to view them? Thats not at all precise...]
- ease of use for ml experts [interview with expert?!]
- supports a demonstration mode, where the user starts with a clean slate (programming)
- allows the discussed functionality (programming, finishing specification)
- stable version [load test]
- configurability (changes in the known list of changeable objects (kafka server, spark server, kafka topics, classifiers, validation methods, evaluation methods, datasets))
- changable (code designed in a way to make changes easier)

3 Work packages

- Evaluating technologies (mostly done) 3 of 3.5 d
- Technical setup (partially done) still left: 1 of 5,5 d (get the kafka connection running, get everything running on docker, link docker images, move git repo to the gt-arc repo, make sure everything runs on the linux vms it needs to run)
- Proposal (started) 0.5 of 3 d + communication time
- Evaluation state of the art () 1.5d
- Programming (started) 5 of 25 d
- Bugfixing (this will happen and must be considered) 4d
- Creating expert interview (Questionnaire, Showcase, Interview, Evaluation) 6T
- Writing thesis () 20d (+ if I can use parts of the time I am putting into this proposal for the final thesis)
- Feedback and corrections 6d
- Presentation () 2d (1,5d preparation, 0,5d the presentation itself)

I am assuming 8h days.

My problem here is, that I have by my estimation about 76,5 days worth of work, plus everything I have yet forgotten and there is no real time for anything unforeseen in the plan. If that is somewhat accurate then, in the best case scenario, this is about 70 percent more time then the 12LP that the Prüfungsordnung says it should take.

Gantt diagram see appendix.

4 Schedule

The time allotted to a bachelor thesis as defined in my examination regulation (StuPO-BSc-INF-2014) is 20 weeks with an time expenditure of 12LP.

5 Organizational

- Language of this Bachelorthesis is english.
- The thesis will be written with pdf_latex.
- The programming of the user interface uses several languages and technologies.
 - Java with Spring MVC for the backend
 - Angular 5 (typescript) and css for the frontend
 - MongoDB for data persistence
 - chart.js to display results in charts
 - Jackson 2 for automated conversion of data between JSON files and Java objects
 - Docker on linux as hosting system for all used systems
 - Postman for api evaluation
- Supervisors is Christian Geißler
- Evaluators are Prof. Dr. Albayrak and Prof. Kao
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6 Appendix

The Gantt diagram shows the known work packages with their dependencies.

Sparked time plan

