CS. BsC. Thesis Research Plan:

Algebraic Fingerprinting

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Name of the thesis: Algebraic Fingerprinting

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1   Summary of research

This thesis is a literature review on the use of algebraic fingerprinting in faster algorithms for parameterized problems.

2   Research goals and perspectives

The main goal is to understand how faster algorithms can be designed with the utilization of algebraic fingerprinting. The thesis could cover these perspectives: (a) what is algebraic fingerprinting, (b) implementing algebraic fingerprinting techniques, (c) problem specific solutions to linear monomial detection

3   Research materials

The research materials consist of published papers and articles on the topic. There seems to be a lot of material related to the subject.

The thesis research consists of mainly reading through the papers. Without thorough investigation, I would estime the research costs as at least a day or two per paper. However, this is a hard estime since I will not go through the material sequentially when researching.

4 Methods of research

To acquire material, I plan to use Google Scholar, Web of Sciences, Scopus and other academic databases. The idea is to find a paper, locate key terms, ideas and problems, and search for further material using the acquired knowledge. Collecting a lot of material should allow for specifying the focus of the research and thesis.

With the research converging on an area of interest, the relevant material is reviewed and further investigated.

After this, the relevant information and sources are organized and further studied. To help with studying, I will use methods such as mindmaps and own notes, explaining concepts to roommate with own words, relating every information piece with each other.

The organization and relations of information should allow for structuring a report of the research, which will be the thesis.

5 Obstacles

The method of converging on an area of interest is problematic when the behaviour of the interest function is unknown on the domain. This is the case here, since the problem domain of algebraic fingerprinting is new to me. This may bring multiple problems: (1) the function never converges on a specific area, (2) the convergence is really slow and costly in relation reading stamina and work, (3) it is hard to evaluate when this method has converged enough, i.e., the area of interest is small enough for a satisfactory scope.

Another obstacle for research is of course my own schedule, which will be really busy and, even worse, very varying. This means that the weekly workload will not be consistent, which can bring problems with course deadlines.

6 Resources

The research itself is done alone by me. Augusto Modanese is my thesis advisor and can help with understanding the topic itself as well as writing the thesis (methods and language of reporting). With the university, I have access to large databases of papers on the topic.

7 Schedule draft

This is a draft of a schedule, since it is impossible to create one that can be realistically followed with current information.

week no.	done by the end of the week
4	research plan
5	established some scope for thesis
6	Version 1 (2-3 pages: some introduction, table of contents or composition/structure. At least 1 reference)
7	further research with review of scope/topic
8	logical structure for discussion in thesis and some content (headlines and their order for example)
9	Version 2 (10 pages: headline structure (with subheadlines), introduction complete, some important content in)
10	research
11	research
12	Version 3 (aim for final)

8   Table of contents draft

(1) Introduction, (2) Algebraization of problems, (3) Methods for detecting linear monomials, (4) Summary.

This structure and the headlines will very likely change with further research into the subject.