Lecture Course on Numerical Optimization (NUMOPT)
Albert-Ludwigs-Universität Freiburg – Winter Term 2018-2019

Guidelines for the Numerical Optimization Project

(response to be sent by email to messerer@tf.uni-freiburg.de until Jan 11, 2019)

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As explained at the beginning of the course, you have the possibility of doing a project to get an additional 3 ECTS. In the following you will receive some information regarding the scope of the project and our expectations.

If you are interested in doing a project please *let us know via email until January 11*. The email should contain the title of your project, the corresponding authors and a short description of your concept. For application-oriented projects the latter should comprise a description (in words) of your objective, constraints and decision variables. For algorithm-oriented projects the idea of the algorithmic scheme should be briefly discussed.

If you would like to form a group, but do not have a group mate yet, let us know until December 21. We will then put you in contact with each other.

1. The project can be done in groups of one or two people.

2. Projects can be either application- or algorithm-oriented. For application-based projects, the focus should be on the mathematical description of the chosen model, its numerical solution and the interpretation of the results. For algorithm-based projects, the aim is to investigate the performance of the scheme using several simple examples.

3. The report should contain at least one sketch of the modeled system or implemented algorithm.

4. The main result is a written report in (approx. 6 pages) submitted as a PDF file. We strongly recommend using LaTeX[1]. You can consider using the official IEEE template for conferences that can be downloaded here:

   `www.ieee.org/conferences_events/conferences/publishing/templates.html`

5. The report must be a new and self-written document and may not contain any copy of other text or figures. Not a single one. The report must be solely written by the author(s).

6. The report must include a short, interesting title, the name(s) of the author(s) and an abstract. The content should be clearly structured in sections. It should start with an introduction and conclude with a short summary and critical discussion of the results.

7. Figures and tables should have a short caption and be referenced in the text properly, e.g. "the results are shown in Fig. 1". Use the Latex commands `\caption`, `\label` and `\ref`.

8. Plots must contain physical units and axis descriptions.

9. The report must cite all external sources as references at the end and other people's contributions must be acknowledged. Using other people's ideas and help is allowed, even encouraged. But not citing or acknowledging them properly is a crime.

10. Mathematical or physical variables shall consist of one letter only and be printed in italics. This is automatic in Latex, e.g., a_i as `$a_i$`. Physical units and sub- or superscripts that refer to words are in normal roman letters (use `mathrm` when in Latex mathmode, e.g. x_{initial} as `$x_{\mathrm{initial}}$` or $\frac{\mathrm{kg}}{\mathrm{m}^3}$ as `$\frac{\mathrm{kg}}{\mathrm{m}^3}$`. Write, e.g., $m = 5$ kg (and not $m = 5kg$ or m$=$ 5kg).

[1] If you have not learned Latex yet, see this report as an opportunity. It will certainly pay off for your master's thesis

11. On February 8, 2019, during the lecture, a short presentation of 10 to 15 minutes[2] shall be given by the author(s) to the teacher and the class. The slides can be based on material taken from the report and may contain additional content, e.g. videos, if required.

12. The project grade is based on the form and content of the report, the originality and quality of the results, the quality of the slides, the oral presentation and the answers to any questions.

13. **Deadline** for submission of the written report is:

February 8 at 14:00, sent by email to messerer@tf.uni-freiburg.de

[2]The exact time will be announced when the number of projects is known