

Term Project

Due: May 2, 2018 (written report and 10-min oral presentation)

As we have discussed and agreed, in an advanced graduate course as SE/EC/ME 724 a final could be less useful than in a more elementary course. Instead, you will have to complete a project applying some of the knowledge you have acquired in this course. You will present your project in a brief oral presentation and submit a written final report. The report should be typed and concise; you should use your judgment as to how much is too much or too little.

You can work in small groups (no more than two) if you want to and if it makes sense. Goes without saying that I expect more substantial results from 2-person teams.

There are many alternatives for the project. I want you to take the responsibility and specify the topic; you should view this more as a research task rather than as a homework problem. I expect that during this week and the next one you will formulate a concrete proposal for what you plan to do and. You may get in touch with me if you want to discuss it.

Projects can be of different types. Here is a partial list:

- **A case study.** You can choose an application area that you are interested in, identify a subproblem, and solve the subproblem analytically, computationally, or by a combination of analysis and computation/simulation. In such a project the emphasis will be on exploiting the special structure of the particular subproblem, devise or use special purpose methods, and experiment computationally to obtain insight. An alternative computational case study is to evaluate the effectiveness of a set of numerical solvers for some class of problems (typically there are more than one solvers for a class of problems and “benchmarking” them to understand their strengths and weaknesses could be interesting).
- **Original theoretical research.** You may investigate any topic theoretically and try to extend the available theory (or create your own theory). Clearly, this can be risky as there are usually no guarantees that you will get results, but you may choose something that has a (computational) case study as a fallback option.
- **A Survey paper.** (In this case a multi-person team makes less sense, unless the list of papers is large and naturally splits into units). Select one or a few papers on some subtopic related to the course and write a critical and insightful survey report. You should demonstrate in-depth understanding of the chosen subject. Some of the information your report should provide includes:
 1. An exposition of the problem, why it is interesting, applicability, important issues.
 2. An exposition of the key assumptions.
 3. A description of the main results, their importance, intuitive explanation, proof techniques if they are interesting, sensitivity of the results to the assumptions.
 4. Suggestions for future research directions, possible extensions and variations.