Course Analysis, Complexity theory, DD2445, Fall 2023

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The structure of the course

The structure of the course was similar to previous years. In particular the course took place in Period 1 and contained.

- Two lectures each week.

- Weekly homeworks.

- Each student made a 15-minute presentation of a research paper towards the end the course.

Student results

The number of students that did something visible (handed in at least one homework) in the course was 23. Of these 19 have completed the course (5 A, 3 B, 2 C, 8 D and 1 E). One student has asked to post-pone the final presentation due to sick leave.

Teachers involved

Johan Håstad was responsible for all aspects of the course. In other words, he gave the lectures, constructed and corrected the homeworks and listened to graded the student presentations.

Course material

The official book of the course was "Computational Complexity" by Arora and Barak. The book is written mostly with graduate students in mind but contains many chapters that are suitable for a Master level course.

Of the topics covered in the course, roughly half are "basic topics" and were decided before the course started. There was a lot of freedom in which advanced topic to cover and this choice was made jointly with the course participants.

A rough overview of possible topics was given at the first lecture and the choice of topics was discussed again halfway trough the course.

Course evaluation

After the course was completed an LEQ course evaluation form was sent out and received 11 answers. The students were overall rather satisfied with the course. The evaluation parameter that received the most negative replies was

"I was able to practice and receive feedback without being graded". I would agree that there is little opportunity for this in the course. This is partly due to lack of resources. Some of the written answers also called for recitations with an assistant. This would be helpful and might make it possible to give more non-grading feedback.

This is, however, already an expensive course with a lot of teaching effort spent for a limited number of students it is difficult to argue for also having an assistant. Thus I think it is likely that we will not address this problem.

Changes implemented in this years course

Essentially none.

Changes to implemented for the course in 2025

The main part of the examination of the course are the homeworks. It is appreciated by the students and I feel that it is a very efficient way to examine the course. It motivates the students to spend time thinking about the questions of course throughout the entire duration of the course.

The possibility that some students take short cuts and ask generative AI such as Chat-GPT for help to solve the problems has, however, be taken in to account. My feeling is that this year it was not a significant problem. This technology is likely to improve before the course is given the next time in 2025 and a fresh evaluation of the suitability of using homeworks for examination has do be done at the start of that course.

Some students complained that the number of points given for the presentation is too high compared to the number of points given for the homeworks. I can agree that it is easy to get this impression. I suggest to change the grading as follows.

- Grade the presentation as being of $A-$, $C-$ or $E-$ level.

- Let the performance on the homeworks lead to a total that gives a grade in the range from A to E. This is the final grade with the exception that a final A requires an A for the presentation and a final B or C requires at least a C for the presentation. A final E requires an E on both parts.

This would have given the same set of grades for the current course but made the grade for the presentation look less dramatic.