

# COURSE ANALYSIS, undergraduate course

## Second cycle courses, EECS School, KTH , from 2018

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An asterix (\*) denotes non-compulsory data.

### Course data

Course name: Machine Learning for Media Technology  
Course ID: DM1590  
Credits: 7.5  
Credits per module: 7.5  
Time period for course: VT2020  
Teachers: Bob L. T. Sturm and André Holzapfel  
Examiner: Bob L. T. Sturm  
Classroom hours: Almost twice a week for 2 hours each, four labs  
Nr of registered students: 57  
Examination rate, in %: 100

### Goals

Global course goals:

To train media technology students to work with, develop and evaluate machine learning applications.

How the course design helps to fulfill these goals: Lectures, labs, a group project and written report

### Pedagogical development - I

*Changes made* since previous time course was given: This is the first time the course has been offered.

### Course evaluation; comments from students

Based on the anonymous questionnaire.

Evaluation response rate:  $22/60 = 39\%$

Overall student view\*

Positive comments: "The idea behind the course was interesting and fun, and most of the tasks were also fun ...." "Good intro to the subject since this may be one of our possible masters" "The lectures were very interesting and you noticed that a lot of thought was put into making them which was very motivating." "The best aspect of this course was to work with the labs. Because I got a better understanding of the subject."

Negative comments: "The labs were extremely confusing, so was the lectures. The lectures were mostly centered around the math behind machine learning, which can be good for understanding machine learning, but Bob spoke and wrote very fast and in English. The notations were also different for the formulas which made it more confusing. This made me stop attending the lectures and only focus on the labs."

"A better balance between theory and application. ... When the labs are all about just copying code from the lectures there is even less learning... I leave this course feeling like I have learned practically nothing at all about how the programming begins machine learning actually works, and then all the math becomes useless because I don't know how to apply it."

#### Pre-knowledge, comments\*

Course design, comments\*: "I wished that we would have been given to work on the lab assignments before the actual lab occasions" "I would have wanted the lectures to be more often so that you would be able to start with the project much sooner."

"I would have liked the course to give a basic understanding of how to write your own machine learning algorithms (even if they are basic) and then showing how to use already existing libraries to execute the task more efficiently.

Literature, comments: "Advice for future participants: My advice would be to go to the lectures and read the course book. Both were very interesting and helpful.

Examination, comments: No exam in this course. Final project and presentation in groups of 3-4.

Particularly interesting\* comments: "Structure the labs as in other CS courses: release all labs at once and each lab has a deadline where you have to present the finished lab to a course assistant. Presenting the lab to an assistant of the course is a good way of checking that you have understood everything in the lab. Also if all the labs are published at once in the beginning of the course, you are able to have good foresight and start with the next lab once you are done with the first one."

"I would suggest more lab assistants and labs that are easier for them to understand. It seemed like the only answer you got from them when asking about the labs were "copy the code from the lectures"."

"Create exercises and increase lab time so there are more opportunities to ask for help

"I would also like to suggest a little more detailed reading instructions.

"A good improvement would be if you prepared the students a bit more before the lectures. For me, it was often difficult to understand the math and the theory behind the things that we were being taught about. It was over a year since last I studied algebra and geometry and I have forgotten a lot since then."

"Teach the students about Google Colab. A lot of students don't understand the variable scopes and get confused when the code acts weird because no functions are used.

"More preparation before the labs because the labs were very hard. Now you had no idea what to do when reading the instructions in the labs or what the finished code from the teacher did. An "övning", practice lesson, would have been nice, I mean lessons where you just talk about the code and go through it. Now when we talked in the lesson about the code, the teacher says what it did and NOT how the code worked or nice things to think about when coding. Another thing to improve is the number of occasions to get help with the labs. Now it is just 3 hours, but it should be at least two occasions."

## Course teacher's impressions from the evaluation

Comments: The student observations align with our own as to what changes should be made in the next edition. These changes will increase the attention paid to practical aspects and decrease the attention given to theoretical matters. Exercises will be created and scheduled which can prepare students for the labs (P/F). Furthermore, labs will be done as groups and those groups will present their results to the TAs for grading (letter grade, not P/F).

## Course teacher's summary

Overall view: The course ran smoothly, but the literature will be rethought.

**Positive comments:** Attendance was good throughout the course, with more than 50% showing each time. Students overall impression seemed positive to the beginning segment of each lecture, which was devoted to critical discussion of particular (bad or misguided) applications of machine learning.

**Negative comments:** As this was the first time giving the course, it was hard to predict the abilities of the cohort. Part of the first lecture sought to identify the levels present in the course, but the students overestimated their abilities in math and probability. This can be addressed by including more demonstrations during the more math-heavy lectures.

**View on pre-knowledge\*:** The quality of the final projects shows that the students have the necessary prerequisites to do interesting things with machine learning. So this is fine.

**View on course design\*:** The layout of topics is fine, but exercises should be integrated. These exercises should be required and scored pass/fail. Labs should be graded with presentations. Final project and presentations worked well.

**View on course material:** The material is timely and appropriate for the learning objectives. The labs provided hands-on experience.

**View on examination:** The project quality was by and large high, given the time devoted to that portion. However, the grading criteria for the final project and report should be more explicit and codified. Now that the course has been offered there are examples of excellent projects to which students can refer.

## **Pedagogical development - II**

*Outcome of course changes made since last time course was given:* N/A

*Changes to be made before next time course is given:*

1. Create weekly exercises and make P/F (weight 10%)
2. Final project will require the use of both supervised and unsupervised learning methods
3. All labs will be uploaded at the beginning of the course with clear deadlines on when the finished labs must be presented
4. Handwritten notes for the course will be cast as python notebooks for students to work from

## **Other**

**Comments\***