

Module report on FPIA

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Module: IE501614 - Functional programming and intelligent algorithms

Delivery: Spring 2017

Degree: MSc Simulation and visualisation

The module is organised as fifteen full-day sessions on Friday. The delivery is divided between Hans Georg (Week 1–6), Que (Week (7–10)), and Robin (Week 11–15). The 16th week is reserved for revision and catch-up and will be negotiated later.

1 Overall state of the module

It was clear when the module was last evaluated that it is not fit for purpose (cf. the module report 2016). The learning objectives for the degree programme and assumptions on students' prior knowledge have changed since the module was first designed, and module revision has been pending a clarification of the degree programme. This semester we have been forced to deliver a module known to be suboptimal, partly because the programme design is still under discussion, and partly because NTNU require module descriptions more than a year in advance.

2 Evaluation data

Because of the small class, the entire class served as reference group. Every taught session served as a meeting in the reference group. With few exceptions, each teaching day started with an evaluation, asking every student to answer a few selected questions about the learning and learning activities so far. The module conveners took notes, and adapted the delivery as appropriate.

The reference group report was completed, by the students on their own, at the start of the last teaching day.

3 Assessment of the module

The module combines two individually challenging topics, functional programming and artificial intelligence. For most students this is overdemanding, by causing massive extrinsic cognitive load. This has been less of a problem this semester than it was last year,

probably because the module has become elective with a more select group of students, and other modules have changed to overlap with this one.

It has already been decided to remove the emphasis on functional programming and revise FPIA into a pure Machine Learning Module.

In spite of the challenges some students are very happy with the module as it is.

It is interesting to note that several students find functional programming interesting and useful, and at least one think that it makes him a better programmer in other languages and paradigms as well. Thus there is a case for retaining functional programming, but it probably requires a dedicated module to allow every student a satisfactory learning achievement.

Easy-to-follow tutorials form a major part of the learning activities, and these are much appreciated by the students, and seem to be an effective way to learn the fundamentals. However, the students remark that the tutorials become suddenly more challenging when backpropagation is introduced, and then return back to simple beginner's tutorials when the last section on GA starts.

Most students want mandatory coursework because they lack the self discipline to prioritise the module otherwise.

4 Proposed actions

The module requires a thorough redesign. Some problems can be avoided with a single module convener to take full responsibility for the entire curriculum. Some care should be taken to ensure a smooth learning curve throughout the module.

The removal of functional programming from the curriculum of the degree programme should be reconsidered. The programme is already being criticised for being unattractive to computer science students, and for having too little fundamental, theoretical material on the curriculum.