A problem/project-based approach to introductory artificial intelligence

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I am submitting a: **__X__ poster.**

I. Background

DIS is a non-profit organisation based in Copenhagen, Denmark. DIS offers study abroad programs specialised for American students (DIS 2015). An introductory AI course is currently under development by this author (start Aug 21 2015). The students are second years Computer Science majors (or older) originating from different American Universities. The course offers 23 lessons each lasting 90 minutes and imposes a 21-students cap. Completion awards roughly 7 ECTS. In what follows we describe a problem/project-based approach (Prince et al. 2006) to teaching introductory AI. Our focus is on student motivation and creativity facilitated by the use of open-ended problems and inductive instruction; as motivated by the crucial learning objective:

(L) The student is able to analyse, design and implement an *autonomous agent*.

II. A problem/project-based approach

We take a problem-based approach to stimulate the development of (L). To keep a form of continuity, problems are cast in relationship to the *Copenhagent* scenario. In Copenhagent, an artificial agent is cast as a newly arrived DIS student who must act in (a fictitious version of) Copenhagen. An example problem is travelling efficiently using public transportation, motivating e.g. *problem solving as search and heuristics*. For convenience, a single software package provides students with the necessary tools to develop an agent in this scenario. The current intention is to have one or two *task projects* and one or two *discipline projects* (de Graaf et al. 2006). Projects with substantial workload are carried out in groups. To reduce the risk of interpersonal conflicts and encourage collaboration, students form groups throughout the course. Minilectures and class discussions serve as the primary tool to facilitate student needs. This structure is chosen to increase motivation, encourage creativity and provide an adaptable teaching and learning setting.

III. Materials

We provide a custom developed software package, containing a graphical representation of Copenhagent, as well as boilerplate agent code for acting in this scenario (no programming language enforced). This reduces implementational overhead significantly. To achieve a form of gamification, we award points when an agent completes a problem (score optimisation is a standard problem in AI). Inter-student discussion is eased by this use of class-wide software and scenario.

IV. Evaluation

Naturally, the learning objective (L) is difficult to measure, not the least for students. The continuity of the gamified Copenhagent domain acts as a motivator, while also letting students reflect on what they have achieved throughout the course. A simple pre/post-test is administered in the form of a quiz containing questions related to the learning objective (L).

A. REFERENCES

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