Current and Planned Educational Initiatives in AI at the IT University of Copenhagen

Designing Study Programs for Modern Industrial Informatics

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IT University of Copenhagen
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Outline

• My research

• Current: ”Modern AI” Specialization
  – Efficient AI Programming (R.M.Jensen)
  – Advanced AI in Games (G.Yannakakis)

• Future: Data Mining Course
My Research
The Under-deck Stowage Problem

Bay

Location

Under Deck

Over deck

hatch lid

Tiers

Stacks

Slots

Discharge Ports: 1 2 3
Constraints

- Max. Stack weight and height
- Reefer container in reefer slot
- Must form stacks
- No 20 on top of 40
- Cells capacity
- Pre-loaded containers
- All loaded
Objectives

- Min. overstowage
- Max. pure stacks
- Max. free stacks
- Max. free reefer slots
## Results

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<th>IP(ms)</th>
<th>CP(ms)</th>
<th>Optimal Obj.</th>
<th>LS(ms)</th>
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Current: Modern AI Specialization
The Software Development and Technology Study Program (SDT)

**Mandatory module 1:**
Object-Oriented programming Introduction
15 ECTS

**Mandatory module 2:**
Modelling and Design
15 ECTS

**Mandatory module 3:**
Performance and test
15 ECTS

**Mandatory module 4:**
Software architecture and security
7.5 ECTS

**Specialisation module part 1**
7.5 ECTS

**Specialisation module part 2**
15 ECTS

**Optional module**
7.5 ECTS
# Organization of SDT Specializations

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“Intelligent” Products

Win or luse, it was a great game

Win or lose, it were a great game
Affective Products

Sometimes I just popup for no particular reason, like now.
Games
Datamining / Business Informatics
Optimization / Business Informatics
Efficient AI Programming

- Uninformed search
- Informed search
- Local search
- Adversarial search*
- Propositional logic
- Binary decision diagrams I/II*
- Constraint programming I/II*
- Planning
- Decision tree learning
Advanced AI in Games

• Expert Knowledge Systems
  – FSMs, Fuzzy Logic
• Unsupervised Learning
• Supervised Learning
  – Artificial Neural Networks
• Reinforcement Learning
  – Genetic Algorithms, Temporal difference learning
• Hybrids
  – Neuroevolution, Neurofuzzy, Learning Classifier Systems
• Advanced: AI and Affective Computing
Future: Data Mining Course/Program
Our Ideas

• Design a **data mining course** as a **business intelligence course** with technical focus
• Focus on data models
• Consider collaboration with **SAS Institute**
• Consider throwing it as an **industrial training course**
Conclusions

- **AI technologies** like data mining, heuristic optimization, and affective/intelligent computation is **are central to many modern products**

- Classical AI courses fail to connect theory with business practice

- We need to **re-structure AI courses to be aligned with application** (but maybe not rename them)