

What we did not cover in this
course?

ITI8600, 2015

Courses in Spring semester 2015/16

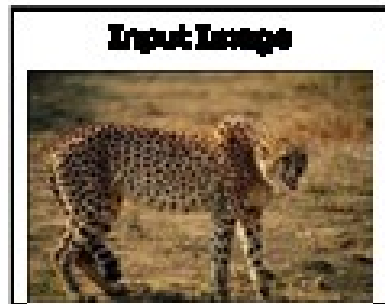
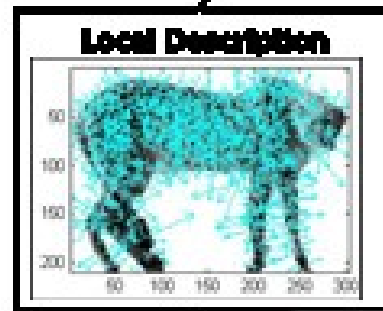
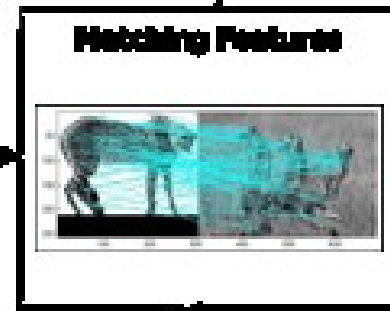
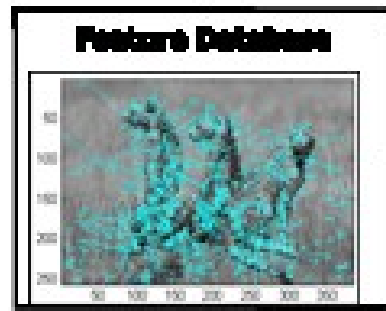
- To point out a few:
 - Formal methods (Jüri Vain)
 - Machine learning (Sven Nõmm)
 - Hybrid systems (Sven Nõmm)
 - Data mining (Sven Nõmm)
 - ...

MSc topic areas

- Hellis Tamm:
 - Theory of regular languages and finite automata; also implementation and experimentation with algorithms.
- Sven Nõmm:
 - Applications of Kinect-based gesture recognition
- Juhan Ernits:
 - Diagnosis modulo theories: practical evaluation
 - F# Type providers for X-Road
 - Model-based testing of robots
- More potential supervisors and topics:
 - <http://www.ttu.ee/infotehnoloogia-teaduskond/infotehnoloogia-teaduskond-1/it-tudengile/magistrioep-42/informaatika-28/>

Search engine technology

- Indexing
 - Page rank
 - Google Panda
 - Google Penguin
- Web crawling



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Various aspects of robotics

- Some of the last chapters of Russell & Norvig are mandatory reading in **Maarja Kruusmaa's** Robotics course.
- There are many applications of AI in robotics
 - Localisation
 - Planning of motion / manipulation
 - Uncertainty
 - Data filtering / sensor fusion
 - ...

Classical planning

- Classical approaches to planning and scheduling
- Planning for acting in the real world
 - time, schedules, resources
 - nondeterministic domains
 - planning for multiple agents

Probabilistic reasoning

- Knowledge in uncertain domains
- Bayesian networks
 - semantics
 - inference
 - relation to first order probability models
- Probabilistic reasoning over time
 - Hidden Markov models
 - Kalman filters
 - dynamic Bayesian networks

Decision theoretic approach

- Utility theory
 - utility functions
 - decision networks
- Sequential decision problems
 - value iteration
 - Bellman equation
 - policy iteration
- Partially observable MDP-s

Natural language processing

- **Einar Meister** is your target if you are interested in the topic.
- Requires a separate course or an MSc thesis research to gain useful understanding of what goes on

Machine Learning

- We only scratched the surface of ML in this course.
- There will be a course in the Spring semester. Let me know if you are interested in receiving information about it!

Prognostics and fault diagnosis

- Prognosis of potential faults
- Detecting faults / locating root causes
- I'm happy to talk about fault diagnosis matters should you be interested in a thesis project

Natural computation

- Aka genetic programming
- Talk to **Jaan Penjam** if you are interested!

Philosophical foundations of AI

- Check out the last 2 chapters of the AIMA book!

Thank you

- See you at the exam!