KTH Machine Design
Mechatronics
Björn Möller, Researcher/Track responsible
Engineering Design master

- Engineering Design at MMK offers:
  - System and component design
  - Combustion engine
  - Mechatronics
What is Mechatronics?

- Mechanics
- Control
- Embedded control system
- Software
- Actuators
- Sensors
- Communication
- Design
- Function, flexibility
- Reliability and safety
- "Intelligent" product
- User-inter

"Intelligent" product
Educational idea

• Production are outsourced outside Sweden - development tend to follow?

• Sweden has great opportunities for development of complex, knowledge-intensive products
  – Requires non-hierarchical structures, high technical competence, creativity, innovation

• We train leaders for the development of advanced products
  – Who understands the technology, the development and the trends
  – Who can actually create new products
Mechatronics research

• Autonomous vehicles
  – On and off terrain vehicles
• Hydraulic control
• Energy optimization
• Prosthetics (3D printing + sensors)
• 3D printing – wood as the sole material
• 4D printing
• Embedded control
  – Architecture
  – Model based design of CPS
  – Design and optimization
  – Safety
• And much more
Autonomous off terrain vehicles

Object detection  Local topology estimation  Map data

Safety zone (Stop activity if occupied by pedestrian)

Tracking control (Computes wheel torques and steering angle to track local plan)

Local plan: \([ X(t) \ Y(t) \ v(t) ]\)

Global plan: \([ X \ Y ]\)

(From harvester trace or drawn in map by operator)
Topology estimation
# Mechatronic master program

### Year 1

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### Year 2

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Capstone Course

- **Course Aim** - Through a close cooperation with an industrial or research partner, the student is expected to work on a complex product development project, while learning to get organized within a large development team.

- Develop a solution to a problem from an industrial or researcher partner – in a development team

- **Format**
  - 5-8 development projects (depending on amount of students)
  - 7-10 team members per project
  - Develop prototype(s), research state-of-the-art, …
  - Report!
Capstone Course – course structure

Spring

Autonomous Recovery Project
Seminar Series
Project management
System engineering
Start of the project
SOTA
Concept design

Fall

HK Project
Building the prototype
Demonstration Report
Capstone courses – project example

- https://www.youtube.com/watch?v=O3kJOswfwMs&list=PLRCuupWU9KjmhcH2SFvOrtC4UhDJobC8&index=3
KTH Prototype center

- Full access to our equipment during your master
Contact

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