

CS 582: Computational Robotics

Objectives

- Covers basic algorithms and techniques used in Computational Robotics, to give the student a good basis for work in this highly relevant field.

Prerequisites

- CS 430.

Syllabus

• Introduction	1.5 hours
• Locomotion	1.5 hours
• Non-visual sensors and algorithms	3.5 hours
• Uncertainty modeling; data fusion	3.5 hours
• State space models; Kalman filtering	3.5 hours
• Visual sensors; sampling theory	3.5 hours
• Image features; depth reconstruction	3.5 hours
• Multiple view geometry; ego-motion; active vision	3.5 hours
• Reasoning; spatial decomposition	3.5 hours
• Geometric representations; topological representations	3.5 hours
• Path planning; spatial uncertainty	3.5 hours
• Active control; pose maintenance	3.5 hours
• Dead reckoning; correlation-based localization	3.5 hours
• Sensorial maps; task planning and task interference	3.5 hours
• Multi-agent coordination	3.5 hours
Total	45.0 hours

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