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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