Robótica Móvel

Presentation

Professors

- Nuno Lau - Course coordinator
  - Covers the second part of the course (From 5-April to 31-May)
- Vitor Santos
  - Covers the first part of the course (From 16-February to 22-March)

Main objectives

- Know the kinematic, electronic and computational structures of mobile robots
- Be able to develop applications involving localization, mapping and navigation
- Be able to develop applications with mobile robots in indoor and outdoor environments
- Know and use techniques for path and trajectory planning
- Know integration/coordination techniques of teams of mobile robots

Course syllabus and planned lessons

1. Introduction   1 week
2. Locomotion   2 weeks
3. Localization   3 weeks
4. Mapping   2 weeks
5. Planning   2 weeks
6. Trajectory following   1 week
7. Multi-Robot Systems   1 week

Classes functioning

- TP Classes (1.5 hours)
  - Presentation of concepts and fundamentals
  - Applied examples
- P Classes (2 hours)
  - Programming and simulation exercises

Assessment

- P Component
  - 2 mini-projects throughout the semester
- TP component
  - Written test in the end of the semester
- Final Grade = 60%P + 40% TP

Bibliography

- Introduction to Autonomous Mobile Robots, Roland Siegwart, Illah Reza Nourbakhsh, Davide Scaramuzza, The MIT Press; 2nd edition, 2011.
- Probabilistic Robotics, Sebastian Thrun, Wolfram Burgard, Dieter Fox, The MIT Press; 1st edition, 2005
- Principles of robot motion, Howie Choset et al., MIT Press, 2005
- Computational Principles of Mobile Robotics, Gregory Dudek, Michael Jenkin, Cambridge University Press, 2nd edition, 2010