Mobile Robots

Student evaluation

Evaluation

- ## Oral examination (15', 60% of the final mark)
  - 1 application
  - 2 specific questions
  - No preparation time, personal material not allowed

- ## Miniproject presentation (40% of the final mark)
  - Presentation & demo (~10' per team)
  - Evaluated by the assistants

Miniproject objectives

- Backup your creativity with sound theoretical background

- Work in a team

- Communicate/demonstrate the result of your work

- Create an opportunity to interact with researchers

Miniproject organization

- Teams of max. 4 people

- 3 different project contents are proposed by the assistants and is linked to a topic covered in the course

- Deadline for registration is indicated on Moodle

Miniprojects - examples

- Sensor characterization and probabilistic model
- Depth from defocus
- Color blob tracking
- Low-level motion control for a differential-wheel robot
- Comparing two approaches to obstacle avoidance with an e-puck
- Vision-based navigation (e.g. using the Hough transform)
- Place recognition using visual features (fingerprints)
- Markov localization (using vision or proximity sensors)
- Waypoint navigation for aerial robots
- Comparing two motion models for localization
- Evaluation and correction of odometry errors
- Line extraction from distance sensor scans (Hokuyo)

Miniprojects - references

- How to search for literature:

  - look at the handouts, look at the references in the slides, books & papers

  - http://scholar.google.com (being connected at EPFL or through VPN helps quite a bit!)

  - http://www.isiknowledge.com (ISI Web of Science)

  - http://www.nebis.ch (needs to know the book/ proceedings title since article titles are not in the database)

  - Ask your assistant

Miniproject evaluation criteria

- Oral presentation (quality of slides, timing, speech clarity, eye contact with the audience)

- Structure of the presentation
  - Introduction (problem description & motivation)
  - Method (and link to theoretical background)
  - Implementation
  - Demonstration & results
  - Conclusion

- Adequacy of the theoretical background with the implementation (is the presented theoretical background well adapted to the problem?)

- Demonstration & results (are they convincing?)

Miniproject evaluation criteria (assistants only)

- Teamwork
  - Is the workload well spread among the team members?
  - Is the group well organized?

- Autonomy
  - Did they propose a nice and feasible project with sound theoretical background by themselves?

- Creativity
  - Is the project more than a slight improvement over an existing exercise from the course?

- Quantity of work prior to the presentation

Oral examination objectives

- ## Application:

  - Evaluate your ability to tackle a complex, integrative problem (there is no unique solution)

  - Evaluate your ability to convince experts by providing educated arguments and by comparing methods

- ## Specific questions:

  - Evaluate your knowledge about 2 specific topics that have been covered in the course

  - Test your capability to reason about these techniques (applicability, extensions, comparison, etc.)

Oral examination – example questions

- Applications:
  - Automatic transportation of heavy goods in hospitals.
  - Automatic anti-pest dispenser in vineyards.
  - Inspection of ventilation system.
  - Home surveillance.
  - Rescue robot for natural disaster.
  - Car for autonomous operation on highways.
  - Autonomous window cleaner.
  - Autonomous dog walker.

- Specific: have a look at the end of each chapter…

Oral examination - hints

- *It's a bit like if you were at a job interview…*
- Make sure you understand the question
- **Use the proposed application to demonstrate how the course content can be applied**
- Do not hesitate to change your mind, but explain why!
- Keep in mind that there is no unique solution
  - you may explore two methods and compare them
  - you should at least motivate your solution (why do you propose this?)