Seminar Summer Term 2017
Selected Topics on Planning and Plan Execution for Robotic Systems

Gerhard Lakemeyer   `gerhard@kbsg.rwth-aachen.de`
Jens Claßen   `classen@kbsg.rwth-aachen.de`
Stefan Schiffer   `schiffer@kbsg.rwth-aachen.de`
Tim Niemueller   `niemueller@kbsg.rwth-aachen.de`
Martin Liebenberg   `liebenberg@kbsg.rwth-aachen.de`
Till Hofmann   `hofmann@kbsg.rwth-aachen.de`

What is this seminar about?

- *Planning*: agent chooses actions by their expected outcomes
- Agent achieves some *goal* without following a fixed procedure
- Planning on Robotics Systems brings additional problems:
    - Knowledge is incomplete
    - Environment may change independent of the robot's actions
    - Humans and robots may interfere
    - Resource and temporal constraints need to be honored
    - Planning system needs to be integrated into a robotic system
- $\Rightarrow$ How can we use planning for robotic systems?

- Seminar counts as one of:
    - Bachelor CS seminar
    - Master CS seminar in Data and Information Management
    - Master CS seminar in Theoretical Computer Science
    - Master SSE seminar in Data and Information Management
    - Master SSE seminar in Theoretical Foundations
- Your task is to
    - read paper(s) about a topic
    - write and talk about it
    - read and listen to the others, give feedback
- These slides are available on the seminar website:
  https://kbsg.rwth-aachen.de/teaching/SS2017/SemToPAPERS

Rough Outline

Five stages:

1. Understand literature; explain to advisor   4 weeks

2. Write and submit the seminar paper   6 weeks

3. Review two fellow students' seminar papers   2 weeks

4. Prepare final seminar paper and slides   3 weeks

5. Give talk, listen to others, ask questions   Aug 08-09

- One or two papers assigned to each topic
- Read them from top to bottom
- Understand them thoroughly
- Sometimes: have a look at basic or related literature
    - check the bibliography of the paper(s) assigned to your topic
    - ask your advisor for suggestions
    - to understand the basics, or
    - to compare to other approaches
    - usually no need to read the complete paper, but
    - be sure enough what it's about before
- What's good / bad about the approach?

- Your seminar paper should
    - summarise the paper(s) assigned to your topic
    - give an overview of the topic
    - convey the **idea** and **intuition**
    - **make the topic understandable to the other students**
    - write what's good / bad
- 12 pages
    - in der Kürze liegt die Würze
    - it's not easy to be concise
    - carefully select what you want to present
- English and LaTeX mandatory
- Use the template from the seminar website

- Your review should
    - help your fellow student to improve his seminar paper
    - prove that you read it thoroughly
- Typical structure
    - Summary of the seminar paper (≈ 3 sentences)
    - Things you liked about it (≈ 1 paragraph)
    - Major comments (e.g., what's hard to understand?)
    - Minor comments (e.g., typos)
- Reviewing should be **anonymous**
- **Plain text** following the above structure
- Do **not** annotate the seminar paper inline (no attachments)

- Read reviews
- Revise your paper accordingly

- Your talk should
  - convey the **idea** and **intuition**
  - as well as the **major results**
  - show that you know what you're talking about
- Try to offer something for everybody:
  - start gently with informal examples
    to motivate problem and sketch solution (first 40%)
  - then go deeper into details (next 30%)
  - conclude at a high level of abstraction (last 10%)
- Tips
  - motivate with an example
  - keep that example to illustrate results during the talk
  - avoid formulas, use example and pictures instead
  - be prepared for questions (perhaps with back-up slides)
  - do NOT take this slide as an example :-)
- 25 minutes talk + 10 minutes discussion
  - do not exceed 25 minutes, practice your talk
  - rule of thumb: at least 90 seconds per slide
- English and PDF preferred

- We use a conference system (EasyChair) for the seminar
- Seminar paper must be submitted there
- Reviews must be submitted there
- Revised seminar paper must be submitted there

- Deadlines are **firm**
- You can update your submission until the deadline
- There's no excuse for missing deadlines

- `www.easychair.org/conferences/?conf=semfar2016`

The final grade is the weighted mean of

- the reviews you wrote (10%)
- your final paper (50%)
- your talk (40%)

Rescission Policy

Up to three weeks **from now on** you are allowed to recede from the seminar without any consequences.
A later rescission will be graded as a failed attempt!

1. Introduction to Planning on Mobile Robots
2. Plan, Repair, Execute, Explain - How Planning Helps to Assemble your Home Theater
3. A Theory of Intra-Agent Replanning
4. Interleaving Temporal Planning and Execution
5. A Temporal Logic-Based Planning and Execution Monitoring System
6. CRIKEY - A Temporal Planner Looking at the Integration of Scheduling and Planning

7. Task Scheduling for Mobile Robots Using Interval Algebra
8. TGA-based controllers for flexible plan execution
9. Challenges in Finding Generalized Plans
10. A Generic Technique for Synthesizing Bounded Finite-State Controllers
11. Representing flexible temporal behaviors in the situation calculus
12. P^2: A Baseline Approach to Planning with Control Structures and Programs

1. Read the abstracts
2. Determine your ranking for the topics ($1 =$ best)
   You may rank two topics the same
3. Send me a text file with your ranking until **tonight**:

   2 Introduction to Planning on Mobile Robots
   1 Plan, Repair, Execute, Explain − How Planning Helps to
       Assemble your Home Theater
   1 A Theory of Intra−Agent Replanning
   3 Interleaving Temporal Planning and Execution

4. You will be assigned a topic

Schedule

2017-04-11: Introductory meeting

2017-04-11: Get an EasyChair[1] account, download paper(s)

2017-05-15: Discuss literature with your supervisor[2]   4 weeks

2017-06-27: Paper submission deadline[3]   6 weeks

2017-07-11: Review deadline[4]   2 weeks

2017-08-01: Paper camera-ready version[5]   3 weeks

2017-08-08/09: Seminar talks   1–2 days

Keep the deadlines:
You can *update* your submission at EasyChair!

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[1] www.easychair.org/conferences/?conf=semtopapers2017
[2] That's the only deadline that's not firm. It's more of a recommendation.
[3] By this date you *must* have submitted
[4] By this date you *must* have written and submitted your reviews
[5] By this date you *must* have submitted your final seminar paper