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

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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

⇒ How can we use planning for robotic systems?
The Seminar

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%)
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
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!

\(^1\)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