

Course Report WASP Graduate School

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Autonomous Systems, 6hp

Semester: Fall 2022

Number of registered students: 42

Answering frequency (course evaluation): 36%

Examination results

Number of students examined: 38

Fail: 0%

Pass: 100%

Brief summary of student viewpoints and suggestions

Results of WASP base-line quantitative questions

- What is your overall rating of the course (1-5): 2.8
- Did you enjoy the course? (1-5): 2.87
- Was it time well spent? (1-5): 2.53
- The course attempted to create teacher/student formations within project groups to 1) get to know more people and build your networks and 2) handle varying backgrounds in a way that allows as many as possible to reach a certain level of knowledge without spending too much time.
 - Did you enjoy this course setup? (1-5): 2,67
 - Did you enjoy the possibilities for networking and getting to know each other? (1-5): 4.07

Answers to free text-questions to be (shortly) summarized under “Strengths” and “Weaknesses”

- What was the best aspect of the course?
- What would you suggest improving?
- What advice would you like to give to future participants?
- Other comments. Is there anything else you would like to add?

"Strengths" according to students²

- The opportunities for networking and getting to know a lot of people.

¹ The report should be written by the examiner together with the teachers and possibly others, such as teaching assistants

² Based on both quantitative results and key viewpoints from students' free-text answers

- The flexibility from the teachers offering additional tasks for students who did not make the original ones in time or could not attend a meeting.
- To learn about control, which is important to be able to understand other persons with that background.
- Nice overview of many different aspects of autonomous systems.
- Assignments and activities were fun with a good level of difficulty, so they were not too time consuming, still allowing a decent amount of understanding of each concept.
- Overall, a fun experience.

"Weaknesses" according to students²

- Course needs to be restructured to help and inspire students who haven't worked with autonomous systems before.
- Change the form of teaching to more lecturing and less self-studies.
- Some activities did not seem meaningful.
 - For example, through a smart phone (DAX remark: logging data from its sensors) in the air.
 - The "phone-throwing activity" did not seem like time well spent.
- Some activities are too simple for those who know the area and too hard for those who don't.
 - It's a hard course to balance since the students have very different background.
- Doing minor modifications to a code skeleton does not provide sufficient understanding.
- Parts of the course relied on that someone in the group knew the subject, which could end up with that this person did all the work.
- Fewer but more difficult exercises.

Comments from teachers on the implementation and outcome of the course³

- We are aware that this course has challenges in that the students have a very varying background and motivation for the subject. Our approach to this was to encourage the students to work together in groups and for students with more experience to take on a tutoring role within the groups. The idea was that this would allow the students with less experience in the area to still get a more advanced exposure to the subject. We feel that this worked quite well last time around but not this time. Some students say that they liked the setup from a networking perspective, but this was just one of the objectives. A possible explanation for why this worked so much better before was that people were starved for interaction because of the pandemic and were more willing to work together and thereby help each other.
- We focused too much on the individual assignments and too little on the big picture. In the original version of the course there was a big project which exposed everyone to the challenges of actual autonomous systems and acted as the glue for the individual topics. It was far too time-consuming though and we

³ Including changes effected during the course

had to abandon that. It was not compensated enough with motivating examples and connections from the individual assignments to the system level.

Proposed changes/comments/measures

- We plan to reduce the amount of forced group work and instead encourage collaboration.
- We plan to go back to using ROS (Robot Operating System) as a middleware in the course with the aim that this will i) better connect the assignment to an overall system and ii) provide a red thread between several assignments and reduce the feeling of having to start over for every new assignment.
- To support the work on the assignment we will have help sessions over Zoom. Hopefully this will be a forum for discussion as well. We will investigate if we can do these meetings in hybrid form so that people can also come and meet physically.
- To meet the challenge with varying backgrounds we plan to introduce different levels of difficulty in the assignments and let students choose which assignments they go a bit deeper into. The basic version of the assignments would then focus on the lower level of knowledge and provide a basic understanding. They would replace what was previously the self-study material and some tasks connected to this would be added. The more advanced levels of the assignments would move into higher level of learning where students apply and analyze.