WASP | WALLENBERG AI, AUTONOMOUS SYSTEMS AND SOFTWARE PROGRAM

WASP Project Course 2021

Daniel Axehill, examiner

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CHALMERS UNIVERSITY OF TECHNOLOGY | KTH VETENSKAP OCH KONST | LINKÖPINGS UNIVERSITET | LUNDS UNIVERSITET | UMEÅ UNIVERSITET

1

Schedule for today

- Course introduction
- Project presentations (videos) and questions
- Group discussions and possibilities to ask more questions about the projects in break-out rooms

2

Course goals

- On completion of the course, the student should be able to
  - develop a working prototype solving a relevant and technically challenging problem in the area of autonomous systems and software.
  - collaborate in a group in a project related to autonomous systems and software where interaction between several individuals with different competences is required.
  - collaborate with Swedish industry in the area of autonomous systems and software.
  - describe and, if applicable, use the possibilities available in the WASP research arenas, or similar industrial demonstrator setting.

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3

Course organization

- 6 hp, to be carried out during fall 2021
- 12 independent projects
  - 5-7 WASP Ph.D. students.
  - Self-driving teams with large responsibility.
  - Each project has one *industrial* supervisor and one *academic* supervisor.
  - The projects are either connected to the existing WASP research arenas, or similar external industrial demonstrator.
  - After you have been assigned projects, there will be a possibility to iterate the contents to some extent, to align it with your background and research interests.
- Supervisors' responsibility
  - **Industrial supervisor:** ensures industrial relevance and scope. Provides necessary industrial resources.
  - **Academic supervisor:** ensures scientific relevance and quality, and monitors the fulfillment of the course goals.

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4

Examination

Course requirements:

- Plan, carry out and follow up the project in an active manner contributing to its completion.
- Record two videos demonstrating and explaining the work
  - One short video (3-5 min) with a demonstration of the capabilities of the system.
  - One longer video (5-15 min) that also explains how the system works.
- A short technical report, preferably in the form of a scientific paper, describing the problem to be considered, the technical solution, an evaluation of the solution, and a discussion of the results.
- Give a presentation, preferably including a demonstration, at the Winter Conference 2022 (the exact presentation form is to be decided).

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5

Examination, cont'd

- Official examiner: Daniel Axehill
- The academic supervisor of each project evaluates the project and therefore acts as the actual examiner of the project.

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6

Course time plan

- Course introduction: **today**
- Select projects using the wish list: **at latest June 21**
- Decisions on which students that are assigned to which groups are communicated: **before Midsummer**
- Meeting with industrial & academic supervisors to decide scope etc.: **As soon as possible after the groups have been assigned**
- Official project start: **End of August** (course runs entire fall 2021)
- There are no planned course-wide meetings during the course
- Project deadline: **December 13 (approved by supervisors)**
- Project presentations: **WASP Winter Conference 2022**

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7

Practical questions

- Travel costs, including hotels, for Ph.D. students are covered by their travel allowance.
- If there arise course-related issues you would like to discuss, there are problems that you need help with from the outside of the project, etc., **never hesitate to contact me!**

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8

Wish list for preferred projects

- A link to a “wish list” has been mailed to you. Please submit your choice at latest June 21.
- You will have to give **four different prioritized alternatives** of which projects you prefer
  - We will make our best to make everyone happy!
- Leave information about if a group has started to form involving certain persons around a project.
- Leave information about special connections and/or competences related to specific projects.
- Project information can be found on the course homepage https://internal.wasp-sweden.org/as-project-course-6hp/

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9

Projects 2021

- Composable Software Tools for the Working Programmer (P1)
- The efficient podcast listener: Enhancing the Spotify podcast dataset using both audio and text (P2)
- Semantic Weed Detection for Automated Agriculture (P3)
- Federated Learning for Safety Assurance of ADSs (P4)
- Safe shared situational awareness and decision-making for automated vehicles using intelligent intersections (P6)
- Vision-Based Deep Reinforcement Learning for Robot Navigation (P7)
- Software Technology for Reliable Autonomous Systems (P9)
- Data driven decision support with multi-characteristic analysis for location scouting (P11)
- Analytics and data visualization for large traffic scenario (P12)
- Docking and planning for unmanned boats (P13)
- Secure & Privacy-Preserving Participatory Sensing of Wireless Interference (P16)
- Vision-based Manipulation and Mobility (P18)

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10

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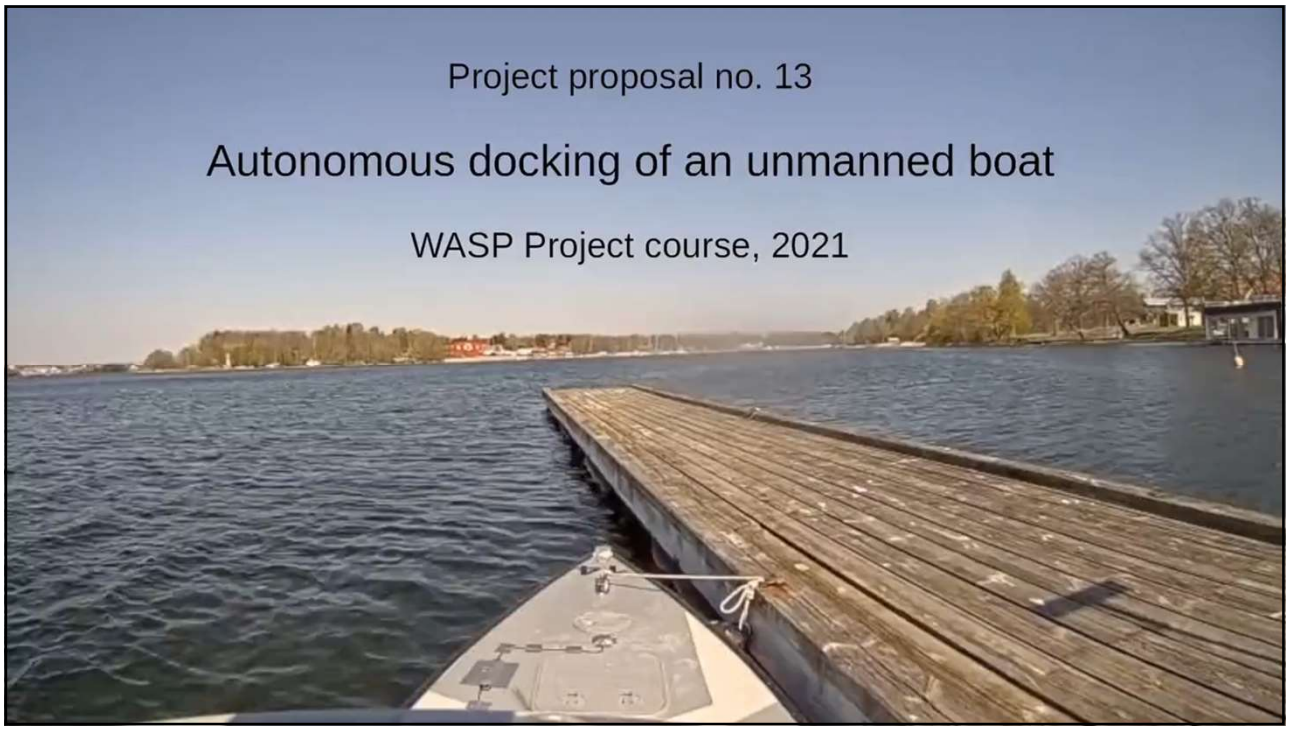
11

P13: Docking and planning for unmanned boats

12



13

P1: Composable Software Tools for the Working Programmer

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14

WASP Project Course 2021, Project #1

Composable Software Tools for the Working Programmer

ERICSSON

Patrik Åberg, Ericsson
Christoph Reichenbach, LU
WARA for Software

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15

P2: The efficient podcast listener: Enhancing the Spotify podcast dataset using both audio and text

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16

17

P3: Semantic Weed Detection for Automated Agriculture

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18

19

P4: Federated Learning for Safety Assurance of ADSs

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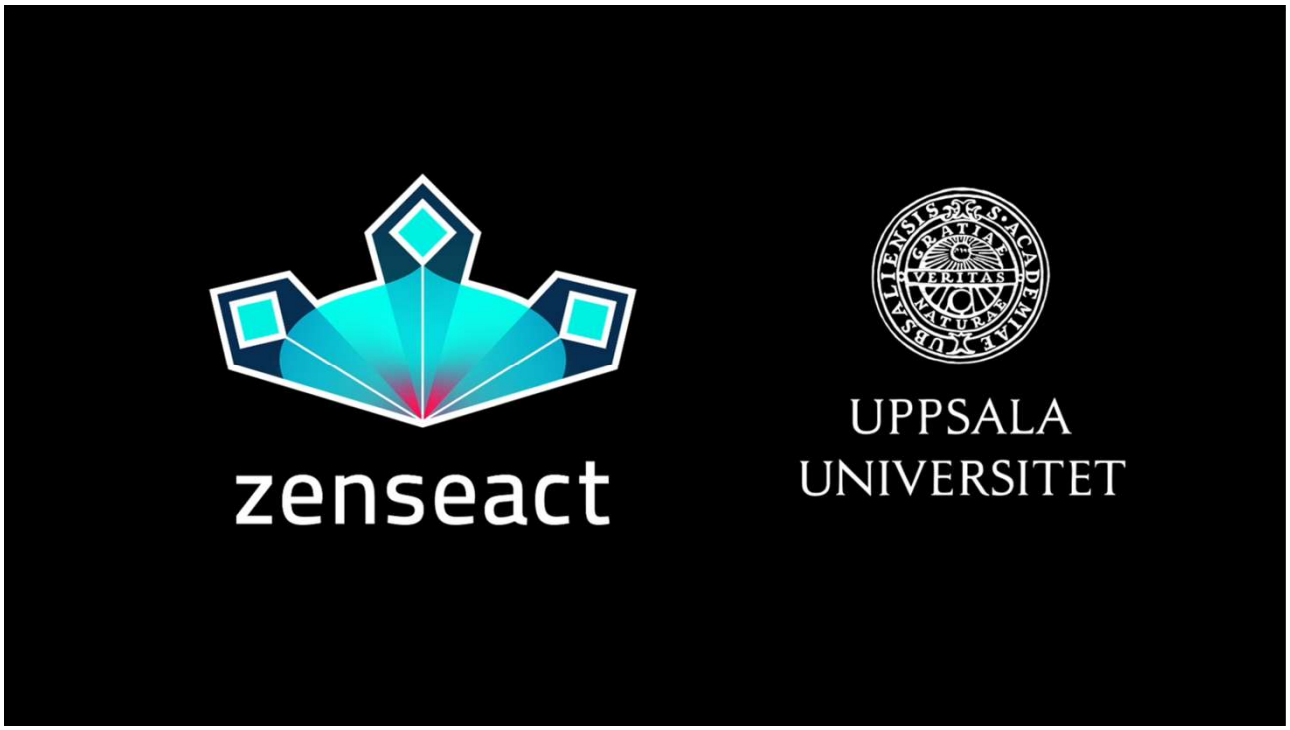
20



21

P6: Safe shared situational awareness and decision-making for automated vehicles using intelligent intersections

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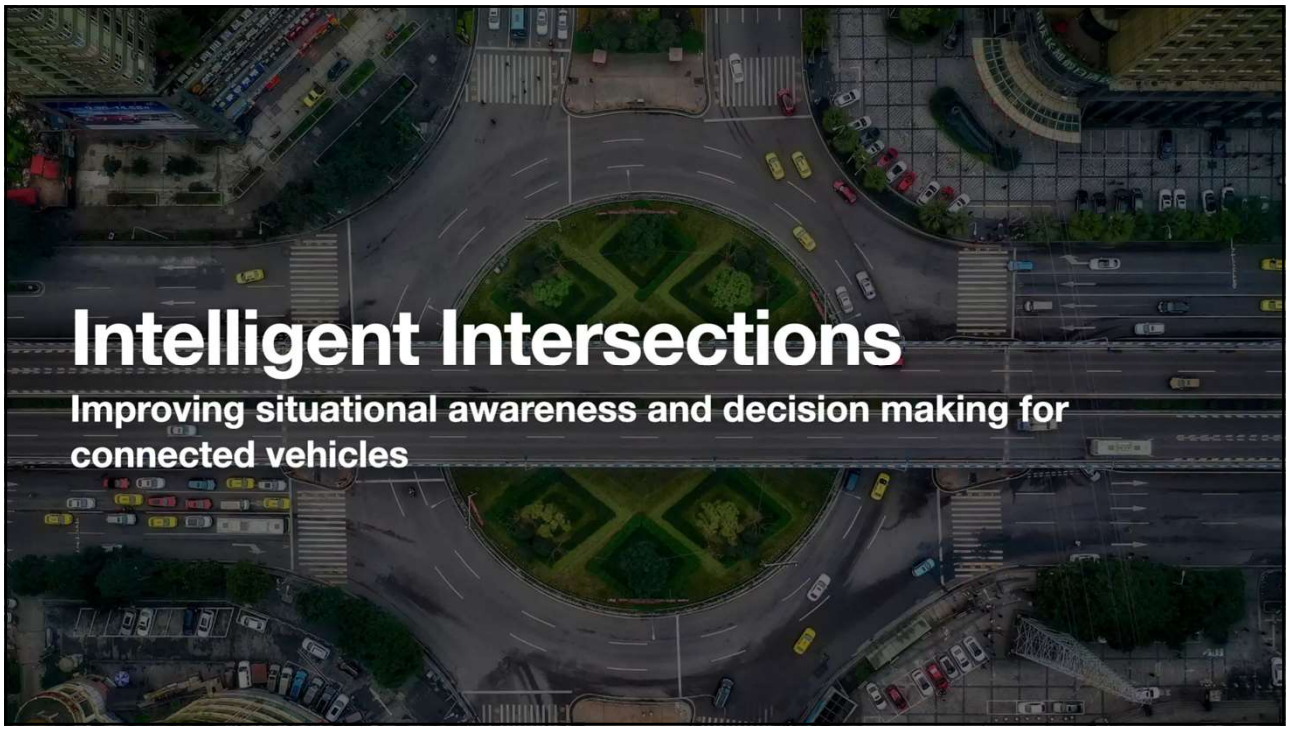
22



23

P7: Vision-Based Deep Reinforcement Learning for Robot Navigation

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24

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Vision-based deep reinforcement learning for robot navigation

WASP project course description

Presentation by Arvi Jonnarth (arvi.jonnarth@liu.se)

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25

P9: Software Technology for Reliable Autonomous Systems

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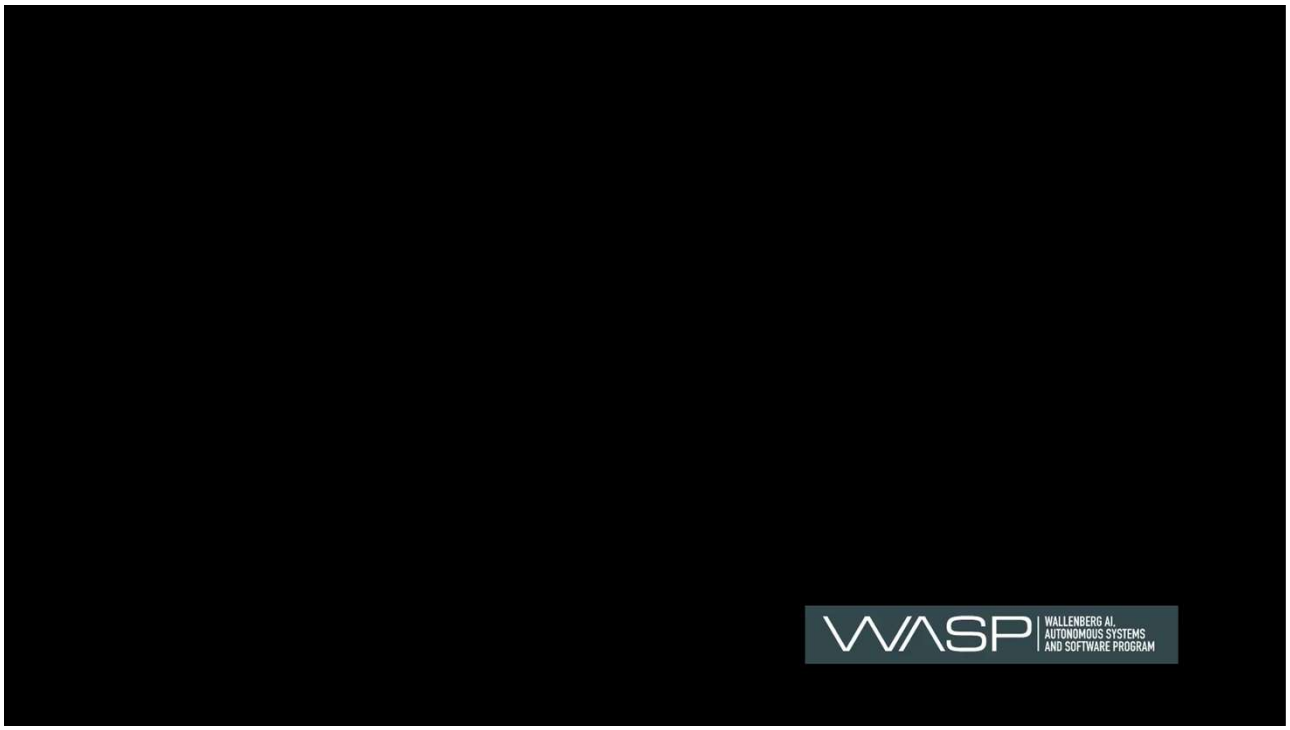
26



27

P11: Data driven decision support with multi-characteristic analysis for location scouting

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28

29

P12: Analytics and data visualization for large traffic scenario

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30

Analytics and data visualization for large traffic scenario

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SAAB COMBITECH

31

P16: Secure & Privacy-Preserving Participatory Sensing of Wireless Interference

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32

Secure & Privacy-Preserving Participatory Sensing of Wireless Interference

WASP WARA Course Project #16

June 17, 2021

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Networked Systems Security Lab, KTH
www.eecs.kth.se/nss

1

33

P18: Vision-based Manipulation and Mobility

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34

And now

35

Project selection summary

- Course homepage: https://internal.wasp-sweden.org/as-project-course-6hp/
  - Project descriptions
  - Projects videos
- Please submit your wish list in the form at latest June 21
- Contact me if anything is unclear!

36

Schedule for today

- Course introduction
- Project presentations and questions
- Group discussions and possibilities to ask more questions about the projects in break-out rooms
  - The Zoom meeting and break-out rooms will be open until 12.00, you are free to leave when you are done!
- Thank you for today!