



Probabilistic Robotics

6 EC | Semester 1, period 1 | 5204PRRO6Y

Owner	Master Artificial Intelligence
Coordinator	dr. A. Visser
Part of	Master Artificial Intelligence, year 2

Course manual 2017/2018

Course content

Probabilistic robotics is a subfield of robotics concerned with the perception and control part. It relies on statistical techniques for representing information and making decisions. By doing so, it accommodates the uncertainty that arises in most contemporary robotics applications.

This course is based on the book 'Probabilistic Robotics', from [Sebastian Thrun](#), [Wolfram Burgard](#) and [Dieter Fox](#). The book concentrates on the algorithms, and only offers a limited number of exercises. Their suggestion is to accompany the book with a number of practical, hands-on assignments for each chapter. The assignments of this course are designed to understand the basic problems concerning mobile robotics.

Study materials

Literature

- › Sebastian Thrun, Wolfram Burgard and Dieter Fox, [Probabilistic Robotics](#), The MIT Press, 2005. ISBN: 9780262201629, 3rd edition.

Software

- › Matlab, Python

Objectives

At the end of the course, the student is able to:

- › develop robust software for robots operating in real-world environments,
- › understand the mathematical underpinnings of their software.

Teaching methods

- › Lecture
- › Computer lab session/practical training

The lectures are to understand the mathematical foundations of the algorithms, the computer lab session are intended to translate the algorithms to software to control robots in the real-world.

Learning activities

Activity	Number of hours
Lectures	24
Lab sessions	24
Self study	120



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Attendance

The programme does not have requirements concerning attendance (OER-B).

Assessment

Item and weight	Details
Final grade	
0% -	
1 (50%) Practical assignments	
0.25 (11%) Exercise 2.8.4	
0.25 (11%) Exercise 4.6.1 & 4.6.4	
0.25 (11%) Exercise 5.8.4 & 5.8.5 and Odometry model	
0.5 (22%) Kalman localization and SLAM	
1 (44%) Particle SLAM on a Nao field	
1 (50%) Exam	

Inspection of assessed work

Feedback on the assignments will be directly given on the reports uploaded to Blackboard.

The final exam can be inspected at the coordinator's office (C3.157),

Assignments

Exercise 2.8.4

individual assignment

Exercise 4.6.1 & 4.6.4

individual assignment

Exercise 5.8.4 & 5.8.5 and Odometry mode

individual assignment

Kalman localization and SLAM

pair assignment

Particle SLAM on a Nao field

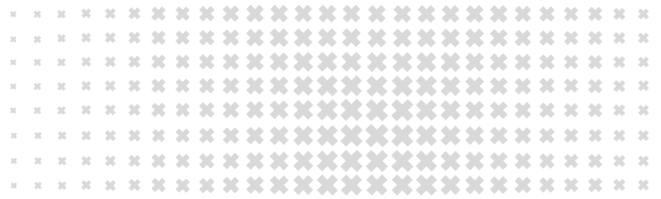
groups assignment

Fraud and plagiarism

The 'Regulations governing fraud and plagiarism for UvA students' applies to this course. This will be monitored carefully. Upon suspicion of fraud or plagiarism the Examinations Board of the programme will be informed. For the 'Regulations governing fraud and plagiarism for UvA students' see: www.uva.nl/plagiarism

Course structure

Week	Chapters	Assignment	Deadline
1	1 & 2	Exercise 2.8.4	07/09/2017 13:00
2	3 & 4	Exercise 4.6.1 & 4.6.4	19/09/2017 13:00
3	5 - 8	Exercise 5.8.4 & 5.8.5 and Odometry model	26/09/2017 13:00
4	9 & 10	Kalman localization and SLAM	
5	11 & 12		10/10/2017 13:00
6	13 & 14	Particle SLAM on a Nao field	
7	17		22/10/2017 23:59



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Timetable

The schedule for this course is published on [DataNose](#).

Contact information

Coordinator

- › dr. A. Visser

Staff

- › Emiel Hooigeboom MSc