

## Teaching portfolio

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## Fundamental pedagogical view

As an instructor giving theoretical lectures to large groups (up to 150 students), I strive to maximize learning and understanding through well-prepared and engaging lectures, combined with practical classes in which students get hands-on experience with the curriculum. "Learning" concerns becoming familiar with new concepts, while true, "enduring understanding" typically requires practical experience with applying the material to concrete problems. The theoretical lectures are primarily for students to learn (familiarize themselves) with the material, while practical classes give the students the opportunity to develop enduring understanding. To maximize learning in the theoretical classes, I have -- after experimenting with different approaches -- found it valuable to conduct weekly, informal assessments of the students' learning progress. Concretely, I typically start lectures with a slide on which there are questions regarding the key takeaways from previous week's class, and ask the students to write down their answers. Afterwards, we then discuss at the class-level. The benefit is threefold: (i) key concepts are reiterated which increases learning, (ii) students are able to assess their own performance, and (iii) as an instructor, I can use the students' answers as evidence of learning or lack thereof, and address any general shortcomings in the students' progress.

Different subjects present different opportunities for practical hands-on experience with the subject matter. In my introductory robotics classes, students built and programmed a Lego-based robot in their first practical class to get a very basic intuition and hands-on experience with robots. In programming and advanced programming classes, hands-on experience is straightforward to obtain, namely by developing, debugging and analyzing programs. Certain aspects of software engineering, on the other hand, can be difficult to simulate in a classroom situation due to the limited scale that practical classes can provide in terms of software development. Still, by introducing a large-scale project in which sub-groups of students develop different components of a larger system, that they then have to integrate, and by relying extensively on a suite of modern CASE tools, the students obtain valuable hands-on experience with state-of-the-art software engineering challenges and solutions.

In summary, my pedagogical project in terms of lecturing is to maximize learning and understanding through engaging lectures, hands-on practical exercises, and to use frequent assessment (formal and informal) as a teaching tool and as an indicator of the students' performance.

## Teaching Experience

At SDU, I designed, developed, and taught the AI-part of a new mandatory 3rd-year bachelor course Introduction to Robotics, Computer Vision and AI for robotics students.

At the University Institute of Lisbon, I have developed an introductory course on autonomous mobile robots, and given courses in object-oriented programming, and in parallel and distributed programming. I have furthermore taught and coordinated an introductory course in software engineering (SE I) and an advanced course in software engineering (SE II). In 2012, I single-handedly coordinated and taught both the theoretical and practical software engineering classes to a total of 213 students enrolled (of which ~89%, 189 students were evaluated). With four extensive assignments during the semester and a final larger project that included the development, test and integration of components from different groups, tools to help automate the grading of assignments were necessary to make it feasible to give the course to such a high number of students.

## Student evaluations

Students have evaluated my performance as an instructor positively. At SDU, student evaluations range from 1 - lowest to 4 - highest. The two semesters that I have taught courses at SDU, I have received a mean score of, respectively, 3.78 and 3.92, which is considered highly positive.

At the University Institute of Lisbon (ISCTE-IUL), student evaluations are given on a scale from 1 - exclusively negative, to 10 - exclusively positive. I received an average of 9 for my performance in the introductory course to autonomous, which is considered outstanding. However, scores tend to depend on the course taught and not only on the instructor's individual performance. In the programming courses, I have received an average student evaluation score of 7, which places me among the higher ranked instructors of those courses. In the software engineering, I have also received an average

evaluation score of 7, but in this case, the score is significantly higher than any of the four other teachers who have given the courses while I was at the University Institute of Lisbon.

## **Pedagogical Functions**

I have held the following pedagogic functions:

- Member of the Education Committee (uddannelsesudvalg), SDU (2020-now)
- Director of the Bachelor in Informatics Engineering, ISCTE-IUL (2011–2012).
- Member of Scientific Commission of the Doctoral Program, ISCTE-IUL (2016–2018)
- IEEE Robotics and Automation (RAS) Student Chapter Advisor (2013-2018), ISCTE-IUL.