Department of Computer and Systems Sciences
Stockholm University
Autumn 2022

Internet of Things (IoT) and IoT applications

Lecturers, Laboratory works and project

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Web Site

Look for the ilearn2 on this URL: `https://ilearn2.dsv.su.se/`
and then for the name and code of this course. The user name and password are the same as the ones for accessing the DSV.

Course Intent and Objectives

The aim of the course is to provide an overview of the main trends and challenges in Internet of Things, models and applications. In particular, the course will emphasize the implications of Internet of Things applications and services. Moreover the course will allow students to discuss their papers in light of some of the most important research developments in Internet of Things and models and application.
The course will give both practical and general knowledge about the Internet of Things, models and applications. After the course the student should have some knowledge of these architectures, models and applications, and understand the basic principles behind them. The student should be able to read and have a good understanding of 90% of the current literature on par with conference papers in this area. In addition, the student should also be aware of the standardization process, new products and services in the area

Objectives

The course provides insight into the Internet of Things information organization, modeling entities and relationships, methods of data storage, and methods for detection and search, in particular shared user and sensor information. The knowledge is then used to provide detailed insights into how this can be used to create context-based applications. The insights deepened understanding of how applications and components shall cooperate with other knowledge infrastructures (eg, Web).
Attendance is expected for all scheduled teaching (seminars, lectures and labs).

Lectures

No.	Day	Date	Time	Room	Topic	Reading Instructions(Text book)
1	Tue.	2022-11-01	15-17	Aula Nod	Course Introduction & IoT Introduction, Innovation, protocols, Context-awareness IoT applications	Ch.1,Ch.2 & online Distributed articles
2	Wed.	2022-11-02	13-15	Aula Nod	IoT& service architecture I	Ch.4,Ch.6 & online Distributed articles
3	Thur.	2022-11-03	15-17	Aula Nod	IoT& service architecture II	Ch.4,Ch.6 & online Distributed articles
4	Fri	2022-11-04	13-15	Aula Nod	Fog computing& crowd sensing I	online Distributed articles
5	Fri	2022-11-04	15-17	Aula Nod	Laboratory assignments Android Studio	Labs instructions Ch. 8.3.3 & online Distributed articles
6	Mon.	2022-11-07	13-15	Aula Nod	Fog computing& crowd sensing II	online Distributed articles
7	Tue	2022-11-08	14-16	Aula Nod	Publish/Subscribe, MQTT, DCXP	Ch. 8.3.3 & online Distributed articles
8	Mon.	2022-11-14	12-14	Aula Nod	Distributed Pub/Sub IoT Intelligence	Ch. 8.3.3 & online Distributed articles
9	Tue.	2022-11-15	14-16	Aula Nod	IoT for Smart Community Sensing Project (Selection)	Ch. 8.3.3 & online Distributed articles
10	Mon.	2022-11-21	13-15	Aula Nod	- IoT, Intelligence -IoT for Smart Community Sensing	Ch. 8.3.3 & online Distributed articles
11	Tue.	2022-11-22	13-15	Aula Nod	IoT for Smart Community Sensing	Ch. 8.3.3 & online Distributed articles
12	Mon.	2022-11-28	13-15	Aula Nod	Proximity Sensing Localization in Sensor Network (Security of IoT devices)	TBD, Ch 7.3.5
13	Tue.	2022-11-29	13-15	Aula Nod	TBD	TBD

Laboratory Assignments

The labs assignments contain exercises and problems that help you understand and implement the theory you have studied and discussed during the lectures. By solving the problems, you will be able to check whether you have grasp of certain topics. You can collaborate when solving the problems with your colleagues, but copying the solutions are not allowed. Lab assignments are worth 30 points. The grade for the lab assignments is Pass or Fail. In case you fail on the Labs assignments, you will need to do additional assignments.

Laboratory Assignments	Group1	Group2	Group3	Group4	Group5 (DIMT)	Group6
Lab1	Wed. 09/11/2022, at **8-12** , D1	Wed. 09/11/2022, at 13-17, D1	Thu. 10/11/2022, at **8-12**, D1	Thu. 10/11/2022, at 13-17, D1	Fri. 11/11/2022, at **8-12**, D1	Fri. 11/11/2022, at 13-17, D1
Lab2	Fri. 18/11/2022 at 13-17, D1	Fri. 18/11/2022 at **8-12** , D1	wed. 16/11/2022 At 13-17, D1	Wed. 21/11/2022 at **8-12**, D1	Thu. 17/11/2021, at 13-17, D1	Thu. 17/11/2022 at **8-12**, D1
Lab3	Wed. 23/11/2022 at **8-12**, D1	Wed. 23/11/2022 at 13-17, D1	Thu 24/11/2022 at **8-12**, D1	Thu 24/11/2022 at 13-17, D1	Fri 25/11/2022 at 13-17 D1	Fri. 26/11/2022 at **8-12** D1

Project

Information will be distributed later.

Literatures

Text book

From Machine-to-Machine to the Internet of Things , Introduction to a New Age of Intelligence. ISBN: 13: 978-0128144350 , Second Edition

1. **The text book is available to download from SU library via the following link:**

https://www-sciencedirect-com.ezp.sub.su.se/book/9780128144350/internet-of-things

2. Building Smarter Planet Solutions with MQTT and IBM WebSphere MQ Telemetry ibm.com/redbooks . (**Optional**).
3. Building the Hyperconnected Society, IoT Research and Innovation Value Chains, Ecosystems and Markets, ISBN: 978-87-93237-99-5 (Hardback) 978-87-93237-98-8 (Ebook), 2015 , River Publishers . (**Optional**).

Background Reading

Materials posted on the course Web page

Seminars

The course consists of a number of seminars. The seminars activities will cover project-oriented tasks and group project work as well a final seminar for the project presentation. **Attendance at all seminars is compulsory**.

Seminars	Group1	Grupp2	Group3	Group4	Group5	Group6
S1	Wed, 30/11/2022, at 13-14:45, L50	Tue, 30/11/2022, at 15-17, L50	Wed, 01/12/2021, At 10-12, L30	Wed, 01/12/2021, At 13-15, L30	Wed, 30/11/2022, At 10-11:45, L50	Tue, 30/11/2022, at 8-9:45, L50
S2	Mon, 05/12/2022, at 13-14:45, L70	Tue, 06/12/2022, at 08-10, L70	Tue, 06/12/2022, at 10-12, L70	Tue, 06/12/2022, at 13-15, L70	Mon, 05/12/2022, at 15-17, L70	Mon, 05/12/2022, at 10-11:45, L70
S3	Mon, 19/12/2022, at 13-14:45, L50	Tue, 20/12/2022, at **8-9**:45, L70	Tue, 20/12/2022, at 13-15, L70	Tue, 20/12/2022, at 10-12, L70	Mon, 19/12/2022, at 10-12, L50	Mon, 19/12/2022, at 15-17, L50
S4	Wed, 04/01/2023, at **08-10**, L50	Wed, 04/01/2023, at 13-14:45, L50	Thu, 05/01/2023, at 10-12, L50	Thu, 05/01/2023, At 13-15, L50	Wed, 04/01/2023, at 15-17, L50	Wed, 04/01/2023, at 10-12, L50

Course Requirements and Grading Policy

The course requires:

1. Lectures, Labs and Seminars attendance.
2. There are Laboratory assignments given during the course. Those will be graded and applied towards the total credit of the course.
3. The submission of a project plan and a project report that applies Internet of Things concepts to empirical problems in a variety of domains.
4. Points assigned for the tasks and points earned for the course.

Grading Policy:

Task	Maximum points available	Percentage	Minimum points required	Points earned for the course
Lab assignments	30	30%	15	2,5 hp
Seminars & project plan	10	10%	5	1 hp

Project	60	60%	30	4 hp
Total	100	100%	50	7,5 hp

In order to have something to start from and manage the project work later, it is important that you make a project plan. In the project plan you describe the background to your choice of project work, formulate the purpose, goals and describe how you will carry out the project and how you should report / present the result. Before starting the project, a project plan must be written, the project plan must describe and guide the project work.

The following should be considered:

- In the project plan you will describe the background, purpose, goals and method for

Project plan

  implementing and reporting the project work.

- It is important that you define your project work in order to be able to complete the project within a reasonable time. As a starting point for writing the project plan, you must use the project description contained in a separate document.
- The project plan must be submitted and approved before you start the project work.
- When the project plan is written, we at DSV can be seen as commissioners of the Project.
- Project plan will cover project goals, team, timing and deliverables.

Submission & limitation of pages

Submission will be done through submission link in the course page, The number of pages should not exceed 3 pages.

The submission deadline for the project plan is **November 28** at 23:55.

Useful link:

http://www.ungaforskare.org/projektbanken/projektarbetet/kapitel-1-ideer-forskningsfragor/hur-man-skriver-projektplan