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Advanced seminar

## AI Planning for Ubiquitous Computing

### Description

Ubiquitous computing aims to create ambience in which one's experiences and quality of life are improved by monitoring and assisting people using the Internet of Things and intelligence in coherence. The current level of intelligence in ubiquitous computing environments is achieved by using predefined sequences of actions that are usually executed in conditions determined in advance and for well-known situations. Such a level of intelligence is limited in that it cannot deal with the dynamics and uncertainty of ubiquitous computing environments, does not consider the needs of those populating the environments, and is ignorant of some global objectives, such as energy saving. Therefore, Ubiquitous computing needs techniques that go beyond predefined solutions and act automatically with sophisticated intelligence. The field of Artificial Intelligence (AI) focuses on developing highly flexible and effective systems for intelligent behaviour, where AI planning provides means for automated and dynamic creation of plans. The field of AI planning was initiated in the 1970's and has made significant progress in theory and practice since. AI planning provides powerful techniques that require a goal, an initial state of an environment, and some knowledge about the environment to select and combine a course of action that achieves the goal when executed in the initial state. This makes AI planning highly suitable for ubiquitous computing. This advanced seminar will study works that propose AI planning approaches for ubiquitous computing environments.

### Prerequisites

Previous knowledge of the course "Smart Cities and Internet of Things" is helpful but not necessary.

### Procedure

There will be a kick-off meeting at the beginning of the semester, during which seminar organisation and topics will be introduced. Students should select three topics in preference order and inform us. Topics will be distributed based on priority while considering the topic preferences. Students are requested to research the topic, write a paper, and prepare an oral presentation. The advanced seminar will be held as a block event at the end of the lecture period of the semester. There are no meetings between the kick-off meeting and the block event.

## **Paper**

Students have to hand in a written paper of maximum 10 pages about the chosen topic. The paper should be prepared using LaTeX. A template and instructions will be provided. Students must submit the paper two weeks after the block event.

## **Presentation**

Students have to give an oral presentation of about 25 minutes. A slides template will be provided. Students must submit the first draft of the presentation one week before the block event. Students must submit the final presentation on the day of block event.

## **Participation**

Students have to be present at the kick-off meeting and the block event.

## **Grading**

The presentations, papers, and active participation will be graded.

## **Language**

Presentations and papers must be in English.

## **Topics**

Possible categories of topics include planning techniques, planning models, planning systems, and applications.