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Advanced seminar

AI Planning for Ubiquitous Computing

Description

Ubiquitous computing aims to create an ambience in which one's experiences and quality of life are improved by monitoring and assisting people using the Internet of Things and Artificial Intelligence (AI) in coherence. Traditionally, ubiquitous computing environments achieve their objectives by relying on predefined sequences of actions usually executed in conditions determined in advance and for well-known situations. Such a level of intelligence is limited in that it cannot adapt to the dynamics and uncertainty of ubiquitous computing environments, does not consider the needs of people populating the environments, and is ignorant of some global objectives, such as energy saving. Such limitations highlight a crucial need for techniques that go beyond predefined solutions and act automatically with sophisticated intelligence.

AI Planning emerges as a promising solution, offering the tools to create automated, dynamic strategies for action. Since its inception in the 1970s, AI Planning has made significant progress in theory and practice, offering powerful techniques and tools that can select and combine actions to achieve specific goals based on the initial state of the environment and knowledge about what can be done in the environment. This capability aligns perfectly with the needs of ubiquitous computing, suggesting a vast potential for innovation. This advanced seminar will delve into the intersection of AI Planning and ubiquitous computing, exploring literature on current techniques, models, systems, and applications of AI planning.

Prerequisites

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

Procedure

The seminar begins with a kick-off meeting at the start of the semester, where we introduce the seminar's structure and available topics. Students are asked to select three topics in their preference order and inform us about their selection. Every student will receive a topic based on the preference and on a priority basis. Students are expected to conduct research on their assigned topic, resulting in a written research paper and an oral presentation. The seminar ends with a block event at the end of the semester's lecture period, where students deliver their presentations. A schedule for these presentations will be provided a week before the block event. While there are no other mandatory meetings between the kick-off meeting and the block event,

we offer optional meetings for further guidance and discussion. The dates for these meetings will be communicated during the kick-off meeting.

Paper

Students must submit a written paper of maximum 10 pages on their topic. The paper should be prepared using LaTeX. A template and instructions will be provided. The deadline for submission is two weeks after the block event.

Presentation

Students must give an oral presentation of about 25 minutes on their topic. 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 the block event.

Attendance

Attendance is mandatory at both the kick-off meeting and the block event.

Grading

The final grade is composed of the quality of the paper (50%), the quality of the presentation (40%), and active participation at the block event (10%).

Language

Presentations and papers must be in English.

Topics

The seminar covers a range of topics, from planning techniques and planning models to planning systems and applications.