WAIz - Hypermedia-based agents using foundational models and knowledge exchange to create personalized plans

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- Background
- Challenge
- Principles
- Experience
- Scenario
- Questions
- Solution

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overview

Background

- Hypermedia (Web-based) Multi-Agent Systems: a class of multi-agent system engineering principles which leverage the web to build uniform interactions among heterogenous entities: e.g. people, software agents, devices, digital services, knowledge repositories

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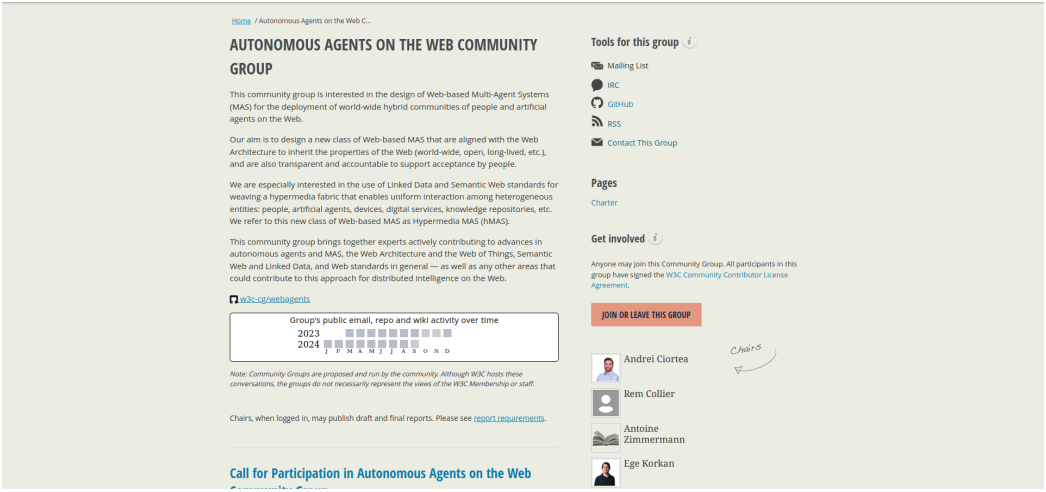
- The Web becomes the environment of a software agent
- Connections with research domains of: Digital Twins, Knowledge Graphs, Web-of-Things ThingDescription

Background



Home / Autonomous Agents on the Web C...

AUTONOMOUS AGENTS ON THE WEB COMMUNITY GROUP

This community group is interested in the design of Web-based Multi-Agent Systems (MAS) for the deployment of world-wide hybrid communities of people and artificial agents on the Web.

Our aim is to design a new class of Web-based MAS that are aligned with the Web Architecture to inherit the properties of the Web (world-wide, open, long-lived, etc.), and are also transparent and accountable to support acceptance by people.

We are especially interested in the use of Linked Data and Semantic Web standards for weaving a hypermedia fabric that enables uniform interaction among heterogeneous entities: people, artificial agents, devices, digital services, knowledge repositories, etc. We refer to this new class of Web-based MAS as Hypermedia MAS (hMAS).

This community group brings together experts actively contributing to advances in autonomous agents and MAS, the Web Architecture and the Web of Things, Semantic Web and Linked Data, and Web standards in general — as well as any other areas that could contribute to this approach for distributed intelligence on the Web.

w3c-cg/webagents

Group's public email, repo and wiki activity over time

2023
2024
J F M A M J J A S O N D

Note: Community Groups are proposed and run by the community. Although W3C hosts these conversations, the groups do not necessarily represent the views of the W3C Membership or staff.

Chairs, when logged in, may publish draft and final reports. Please see report requirements.

Call for Participation in Autonomous Agents on the Web

Tools for this group

Mailing List
IRC
GitHub
RSS
Contact This Group

Pages

Charter

Get involved

Anyone may join this Community Group. All participants in this group have signed the W3C Community Contributor License Agreement.

JOIN OR LEAVE THIS GROUP

Chairs

Andrei Ciortea
Rem Collier
Antoine Zimmermann
Ege Korkan

Challenge

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  - Agents may be able to share learning experiences among themselves

Principles

- Humans tell agents *how* to work with devices and services in their environment in order to obtain desired results.
- Agents exchange information among them regarding how to operate APIs and how to sequence actions to achieve the results obtained in their experience.

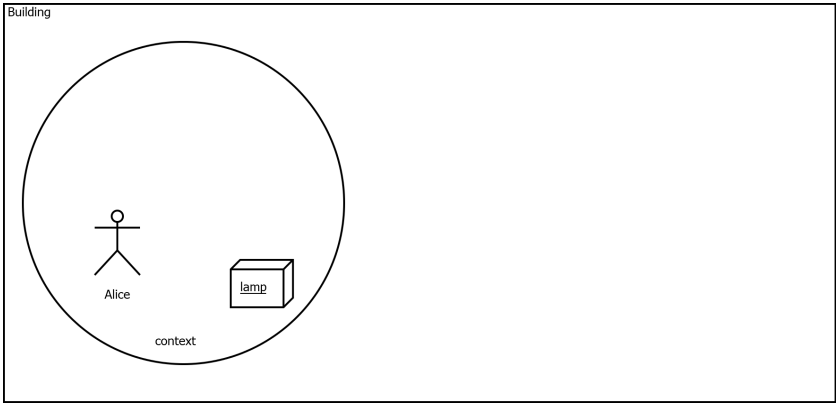
Experience

The AI Folk [aifolk.upb.ro] project explored exchanging pre-trained ML models among agents in a community, based on the compatibility between a model and the current situation of the agent.

The project provides valuable experience on integrating ML models dynamically, describing them semnatically, and selecting them based on their properties.

Smart building / Energy management

Scenario



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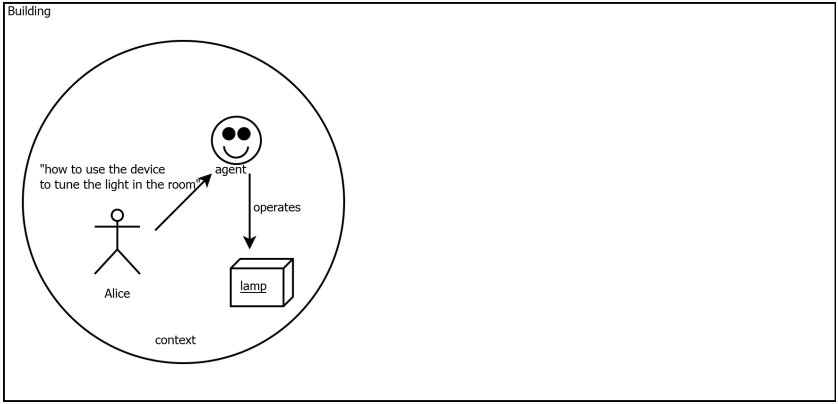

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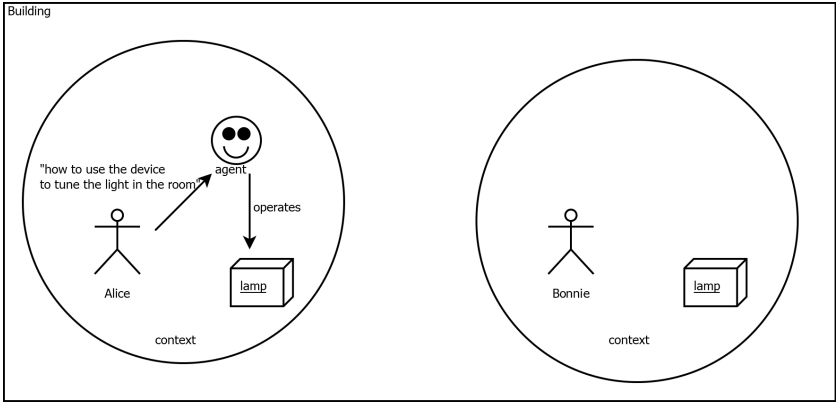

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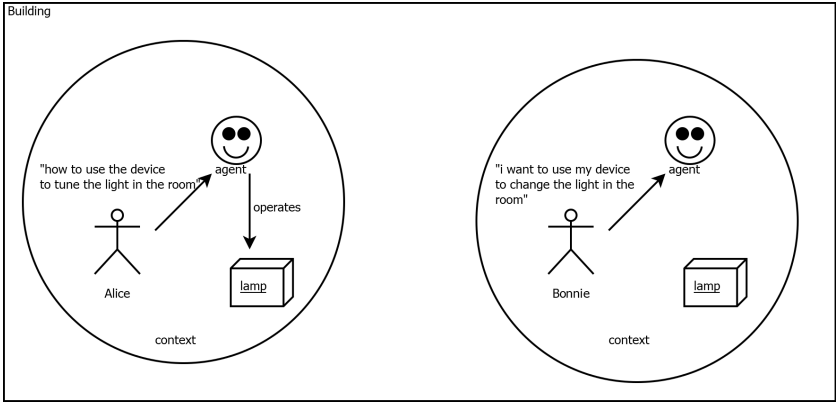

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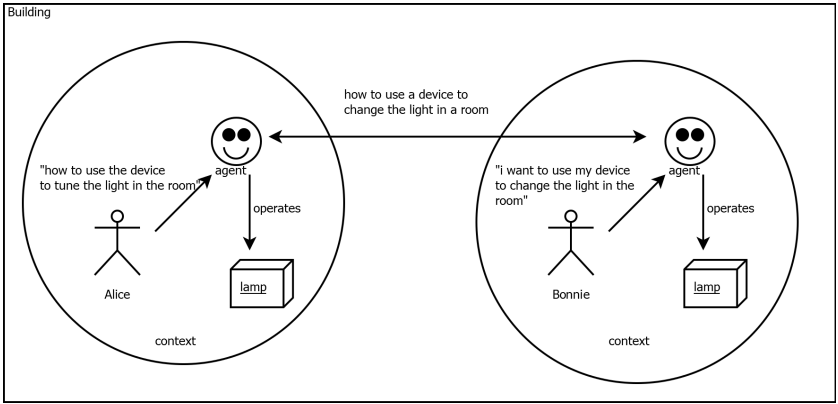


Research questions

- How to interact with a human user to determine the current situation in an area, what are the users' preferences, what is a desired set of actions?
- How to determine the actions to take in order to fulfil the users' preferences?
- How to define and determine the available affordances of devices in a given context?
- How to use those affordances to obtain the desired results in a the users' context?

Towards a solution

WAIz – web-based hyperagents using AI models to create personalized plans.

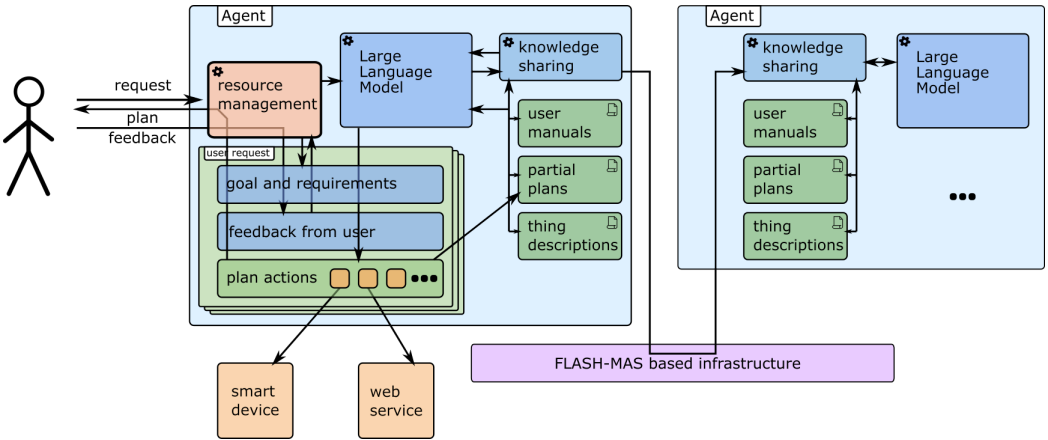
Towards a solution

- The agent interacts with the user to obtain knowledge about the context of the user and the user's desired target.
- The agent interacts with the user or with other agents in order to find *how* to achieve the given target
- Agents use LLMs for interaction in natural language, but structured knowledge is used for Thing Descriptions, user manuals, plan libraries, etc

Towards a solution

- An agent can receive queries from other agents
- It can tell other agents how to use a device, or how to use a set of devices to achieve a goal
- It can attach information on how well this worked

Towards a solution



Thank You!

Questions are welcome!

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