Intelligent and decentralized Applications on constrained objects using Semantic Web technologies for Sustainable Agriculture and Smart Buildings


To cite this version:
Alexandre Bento, Gabriel Martins, Ghislain Atemezing, Fabien Badeig, Mahdi Bennara, et al.. Intelligent and decentralized Applications on constrained objects using Semantic Web technologies for Sustainable Agriculture and Smart Buildings. International Forum of Agricultural Robotic (FIRA 2020), Dec 2020, Virtuel event, France. hal-03114508

HAL Id: hal-03114508
https://hal.science/hal-03114508
Submitted on 24 Feb 2021

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L’archive ouverte pluridisciplinaire HAL, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d’enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.
Constrained Semantic Web of Things

Intelligent and decentralized Applications on constrained objects using Semantic Web technologies for Sustainable Agriculture and Smart Buildings


contact-coswot@liris.cnrs.fr

Problems

- Internet of Things (IoT) connects physical devices
- Heterogeneous devices with various capabilities
- How to build collaboration between devices to propose new services?
- How to break down manufacturers’ silos?

Goal

- The Web of Things (WoT) integrates Web standards with physical devices
- Build a WoT platform to enable the development and execution of intelligent and decentralised smart applications despite the heterogeneity of devices.

Constrained Objects

- Embedded reasoning
- Limited CPU, Memory, Network, resources...

Semantic Web technologies for Interoperability

Network of ontologies:
- Sensor Ontologies: SSN/SOSA, SAREF, CASO...
- Web of Thing ontologies: Thing Description, oneM2M...
- Domain ontologies: SAREF4BLDG, SAREF4AGRI, IRRIG...

Decentralized architecture

- Distributed reasoning
- Processing data close to source (Fog/Edge Computing)
- WoT Servient: first class citizen of our architecture

CosWoT Project Facts

- Dates: Feb. 2020 - Jan. 2024
- Budget: 1.05M€
- HR: 306 person*month
- Website: https://coswot.gitlab.io/

Smart Building Use Case

- User comfort and safety
- Personal data reports
- Management of room ventilation (COVID)

Smart Agriculture Use Case

- Automatic irrigation based on weather station
- Field access management for robots
- Crop phenological stage detection

Acknowledgements

This work is supported by grant ANR-19-CE23-0012 from Agence Nationale de la Recherche for project CoSWoT.