



IEEE SA - 1872.2 Standard for Autonomous Robotics (AuR) Ontology Working Group

Call and Agenda

Meeting Agenda for April 9, 2020, 1PM-2:30PM UTC

You have been invited to the IEEE SA WG P1872.2 meeting. Join the meeting:

<https://join.skype.com/Buruz9jby49e>

1. Call to order (Howard)
2. Introduction and rosters (Alberto)
3. Approve today's agenda (Howard)
4. Approve prior meeting's minutes (Alberto; March 12)
5. Essential Patent Claims (Alberto)
6. Status updates/previous action items (Howard)
7. IEEE Copyright Policy (Howard)
8. Technical discussion (OWL implementation of current vocabulary)
9. Next meeting's topic: nomination of presentation
10. New business/announcements/events/last thoughts
11. Close meeting (Howard)

Minutes for the Official Meeting on April 9, 2020

Alberto Olivares-Alarcos transcribing



Rosters

- Y and N state for Yes and No
- ^ means the attendee is a *Voting Member*
- Members highlighted in **green** are eligible to become a *Voting Member*
- Members highlighted in **red** are eligible to lose *Voting Membership*
- Last column contains today's meeting attendees

Attendee Name	Role	Affiliation	Current Voting	Meetings Attended / last two	9-Apr
OBSERVATIONS					
Howard Li	Chair	University of New Brunswick, Canada	Y	2	Y^
Paulo Gonçalves	Co-Chair	IDMEC, Portugal	Y	2	Y^
Veera Ragavan	Co-Chair	Monash University, Australia	Y	2	Y^
Alberto Olivares Alarcos	Secretary	IRI-CSIC, Spain	Y	2	Y^
Alaa Khamis	Member	General Motors, Canada	N	2	Y
Chris Nowak	Member	DST Group, Australia	Y	2	Y^
João M.L. Quintas	Member	Pedro Nunes Institute, Portugal	Y	2	Y^
Julia Bermejo	Member	UPM, Spain	Y	2	Y^
Ricardo Sanz	Member	UPM, Spain	N	1	Y
Stefano Borgo	Member	ISTC/ CNR, Italy	N	2	Y
Edison Pignaton	Member	UFRGS, Brazil	N	1	Y
Elisa Tosello	Member	UNIPD, Italy	N	0	Y
Daniel Beßler	Member	University of Bremen, Germany	Y	0	N^
Mohammed Diab	Member	UPC, Spain	Y	2	Y^
Marcos E. Bareto	Member	UFBA, Brazil	N	0	N
Bao U. Nguyen	Member	University of Ottawa, Canada	N	0	N
Joanna I. Olszewska	Member	University of West Scotland, UK	Y	1	Y^
Amelie Gyrard	Member	Knoesis, Wright State University	Y	2	Y^
Edson Prestes	Member	UFRGS, Brazil	N	0	N
Sandro R. Fiorini	Co-Chair	IBM, Brazil	N	0	N

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Joel L. Carbonera	Co-Chair	UFRGS, Brazil	N	0	N
Hiren Nakawala	Member	University of Verona, Italy	Y	1	Y^
Carlos Hernández	Member	TU Delft, Netherlands	N	0	N
Abdelghani Cibani	Member	UPEC, France	Y	0	N^
Eren Erdal Aksoy	Member	Halmstad University / Volvo	N	0	N
Maki Habib	Member	American University in Cairo	N		Y
Dormant/Inactive					
Kathryn Bennett	Guest	IEEE-SA	N		
Craig Schlenoff	Member	NIST	N		
Jaeho Lee	Member	University of Seoul	N		
JiSang Hoon	Member	KITECH, Republic of Korea	N		
Ki-Yeop Sung	Member	KAR, Republic of Korea	N		
Taeyoung Uhm	Member	KIRO, Republic of Korea	N		
Sebastian	Guest	IEEE-RAS	N		
Christy Bahn	Program Manager	IEEE-SA	N	0	
Signe Redfield	Guest	United States Naval Research Laboratory	N		
Ali Akbari	Guest	UPC, Spain	N		
Total Attendees					17
Voting Members			13	0	13
Voting Members Present					11
Quorum					Y

Abdelghani and Daniel lost their voting membership. Alaa and Stefano became voting members.

Approval today's meeting agenda

Motion Proposal : Howard

Seconded by: Alberto

Accepted Agenda: Yes

Approval prior minutes

Minutes were distributed and also made available on our google drive. Thus, members could have read them, but Alberto summarized the minutes to ensure that everyone knew about



them.

Motion Proposal: Alberto

Seconded by: Paulo

Accepted Minutes: Yes

Call for Essential Patent Claims (Alberto)

Done

Status updates/previous action items (Howard)

- Future publications
 - Article for RobOntics Workshop - Website: <https://robotics2020.github.io>
 - Book chapter suggested by Amelie - Architecture
 - Article about Knowledge driven design of robotic applications - Veera
- Vocabulary development
 - Alignment with Task Representation group - Paulo and Hiren in both groups, they will keep us updated
 - Needed to validate using case studies - Validation to see whether we need more entities or not
- Focus on case studies to validate the vocabulary
 - **[ONGOING] Mohammed's (we are working on it now)**
 - Amelie
 - Chris
 - FAiNDER (a company) which will use our standard in a Humanitarian Robotics scenario (landmine detection)
- **[NEW]** Christy Bahm asked us to start working on the draft for the standard
 - Howard has started filling up the draft's template. We will split sections, feel free to read it and choose a section to work on
- **[CANCELLED]** In person meeting at **ICRA 2020** in Paris, **Sunday May 31, 9:30AM-2PM in room 234/235M**. Paulo, Alberto, Julia, Mohammed, Stefano, Christy, Hiren, Abdelghani, among others, have shown interest
- Attracting industrial partners
 - FAinDer (already contacted and accepted, the CEO will join to our group)
 - KUKA (potential)
 - General Motors (they are already happy using SAE standard)
 - Veera got in touch with people from both OPCA and VDMA interested in collaborating with us. He will keep us updated about it
- Cloud Robotics' paper conditionally accepted to the minor comments from reviewers:



- Submitted to *Journal of Ambient Intelligence and Humanized Computing*, Special Issue on "Internet of Things for Everyday Living: Ubiquitous Intelligence at Scale"
- Edison has already re-submitted the revised version of the article, addressing the reviewer's comments

Copyright Policy (Howard)

Done.

Howard went through some slides about the copyright policy of IEEE. This policy is relatively large so we are not going to include all the material here, but two key points must be kept in mind:

- Anything (verbal or written) we discuss we need to make sure it has not copyright, if it has, we cannot discuss it during the meeting without official permission from the copyright holder.
- Whenever you bring some material to the group and it is discussed along with our meetings, you are granting the copyright of it to the IEEE. Either if you are the holder or your affiliation center is the holder. In the later case, you would need permission from your company or university. Note that when something which has copyright it is discussed during our meetings (sometimes permission would be needed), automatically, the copyright license will be granted to the IEEE. Note that anything developed during our group work, will have a copyright license owned by IEEE once the standard gets published.

Technical discussion

Topic: Mohammed's Case Study to validate the Standard's Vocabulary

Extension of his previous work where two robotic arms perform a collaborative pick-and-place task. In the new proposed scenario, another robot, with both manipulation and navigation capabilities (Tiago - PAL Robotics) enters in the loop, extending the capabilities of the other two static arms. We had no comments on it so he will start working on the technical details of his proposal throughout September. **Mohammed** in charge. **LAST UPDATE [SEP-26]:** Waiting for the rest of actions listed below, then, Mohammed will include the vocabulary in his framework. It is fundamental to keep in mind we cannot publish any content of the future standard before it is published.

The current draft of the Standard already contains some definitions of Classes, however, the current version of the file contains a lot of details (from the discussion along the past months).



We plan to reduce the document to have a single definition and example per term. **Stefano** will do this. **LAST UPDATE [SEP-12]:** Stefano already cleaned it, the previous work was put at the end of the document (just in case someone wants to see the discussions) and the section now only contains one single definition per term and examples. Stefano defined a new term which was not before 'action' so we discussed it. Specifically, the notion of 'intentionality' which is part of the definition of action was controversial, Stefano will continue thinking of it. The conclusion was: action will be defined from a neutral perspective and then have a specialisation of it which captures intentional actions.

We have only defined Classes in our first draft of the Standard, but not Relationships (in OWL, properties). The idea is to identify which ones are already defined in the IEEE 1872:2015 and come up with those which are not there and are necessary for us. During August and September, **Alberto**, **Paulo** and **Veera** will work on it offline (help is always welcome). **LAST UPDATE [SEP-12]:** Done and presented on September 6

Once we have done all the previous work, we can start writing the OWL file (we will need someone to do so, volunteers are welcome). **LAST UPDATE [SEP-26]:** Mohammed showed us his work in progress. We discussed the terms of: Time, TimePoint, TimeInterval, Environment, Event and Region.

PREVIOUS INTERESTING INFORMATION - Mohammed pointed out a recurrent issue we have discussed before, some of the terms within the proposed vocabulary were taken from SUMO in the previous standard (e.g. artefact, etc.). Our conclusion is that those inconsistencies will be fixed afterwards. We want to make SUMO optional.

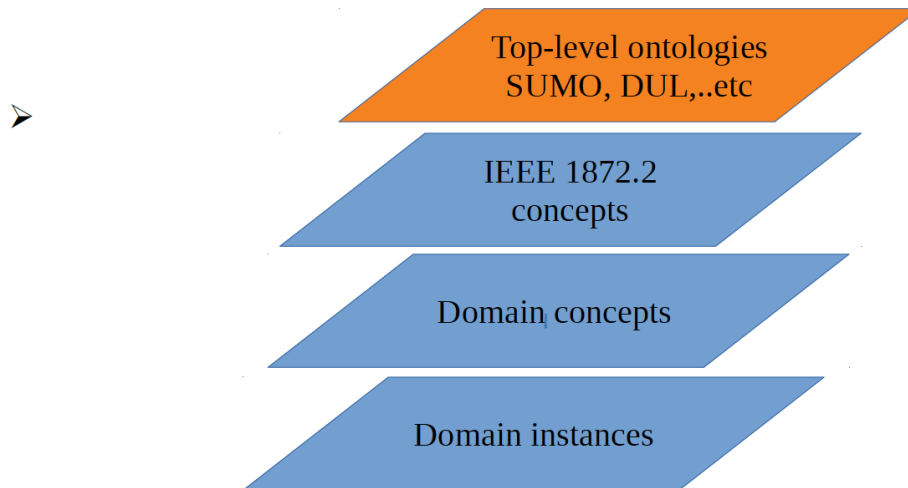
We need to use the previous standard but we agreed to make SUMO optional. We could delete SUMO from the OWL file but this is not straightforward. Hence, we proposed to directly take the concepts we need from CORA (e.g. Robot) and put it in our OWL file always being congruent with the standard but not necessarily with SUMO.

LAST UPDATE during today's meeting: (1) Modelling the ontology. Mohammed is working on the implementation offline together with Stefano. They will work on having ready the OWL file for the current vocabulary and present it to us when the work is more advanced. It probably will be ready within the next few weeks. (2) Modelling the scenario in task-motion planning simulation. Mohammed has prepared a simple simulation of the scenario. We will query the knowledge base during the task-motion planning process to check for instance, the capabilities of the robots. For instance, 'in which object the user drinks coffee/coke?'

During today's meeting, Mohammed showed us a document summarizing the current status of the implementation. Potentially, the scenario could be finished by July.



Mohammed will do some work on integrating the concepts we need from CORA and finish other pending and partially done tasks. Alaa offered himself to help with PDDL, Elisa and Alberto also offered help. See some screenshots below.



1. How the proposed concepts using owl format are represented? **DONE**
2. How owl can be integrated with other ontologies? **PENDING**
3. What are the concepts that used from CORA in the new standard formalization?
PENDING
4. How does the inference mechanism work in the case study?
 - How the reasoning over capabilities is used? **Partially done**
 - How the reasoning over the behavior is used? **Partially done**



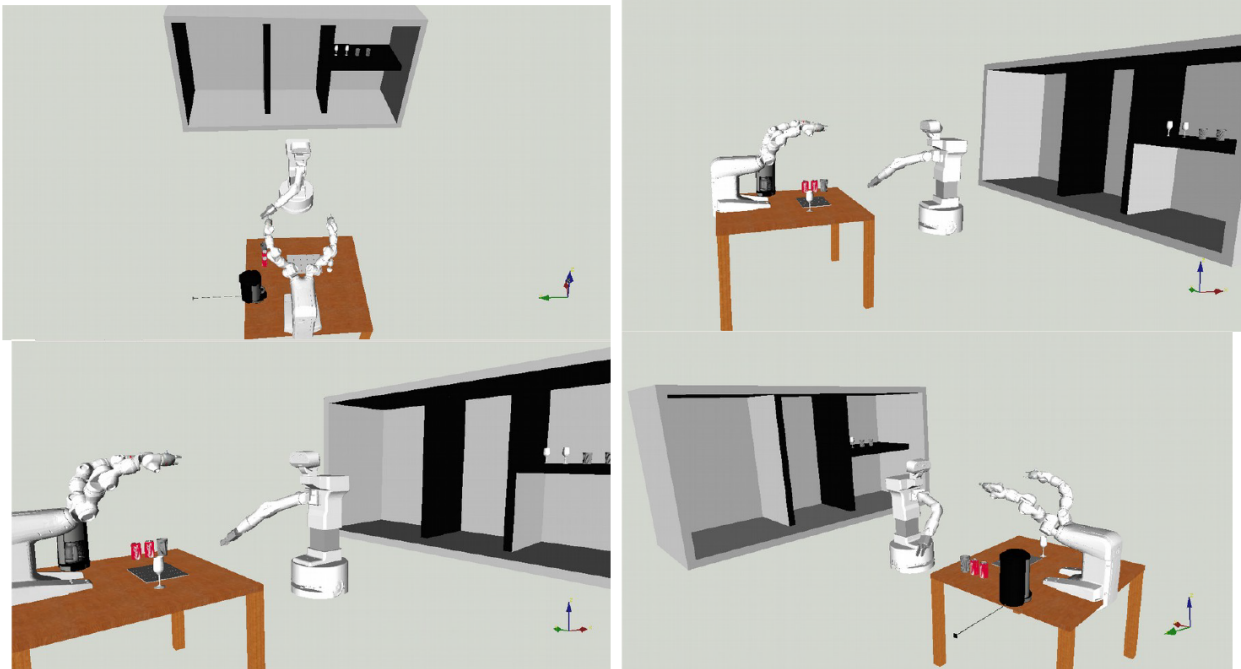
➤ **How to integrate ontologies with heuristic-based planner**

1. Setting the initial and goal states

2. Answering some questions of the planning process such as:

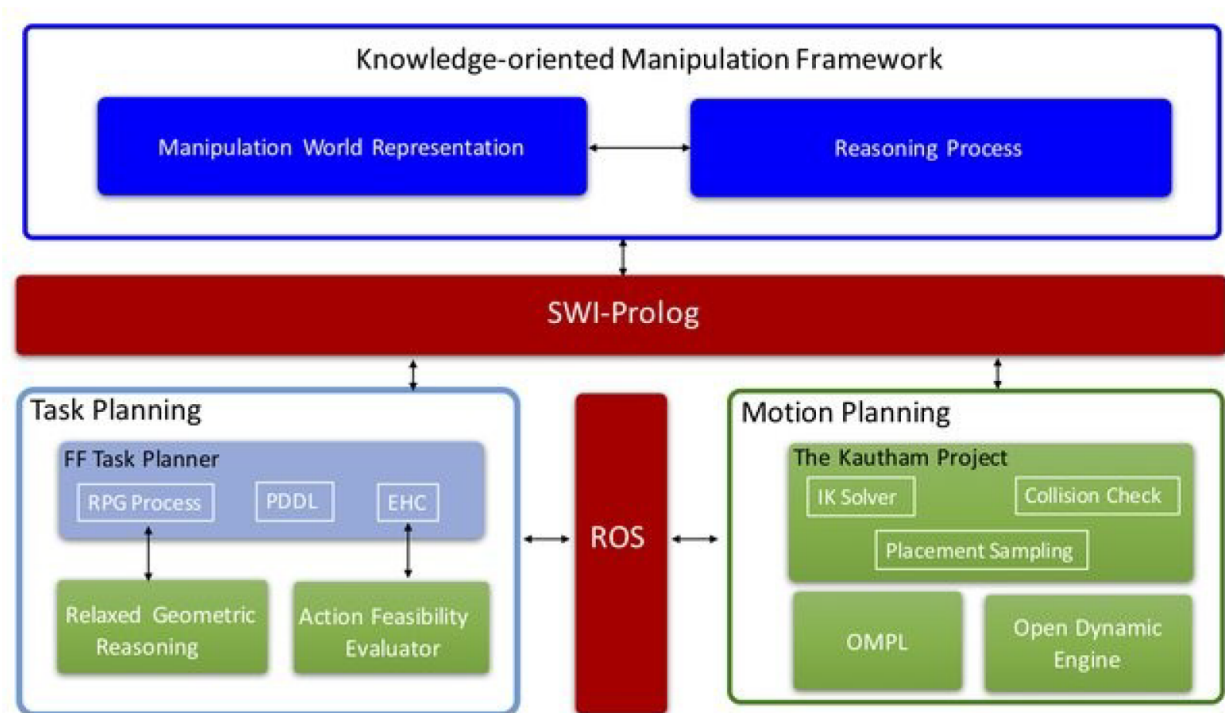
- 1. The robot capabilities, e.g, Is the robot has navigation capability.**
- 2. The action feasibilities, e.g, Is the cup is pickable or pushable.**
- 3. The task constraints, e.g, From where the robot can grasp the object.**
- 4. The object's properties, e.g, What are the object features.**

➤ **Scenario**





➤ Integration between all the required module



Next meeting's topic: nomination of presentation

- Alaa [April 17] - The role of AI and robotics in the COVID-19 pandemic
- Andrea (Edison's contact) about her work (robotics applied to e-health), she is a potential new group member but now she is switching jobs, so she would need more time

New business/announcements/events/last thoughts

- Found Patent from Magazino (see [here](#)) - Howard working on it
- **[CANCELLED - It will be online]** IEEE-SA board's meeting in Berlin June 1-3, it overlaps ICRA.
- Next official meeting for May 7

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Close meeting (Howard)

Adjourned 2:30 PM UTC