

Three New IEEE Robotics and Automation Society Standards Working Groups on Surgical Robotics and Electric Vehicle Charging Robots

By Lei Yang¹, Yifei Hu, Lihai Zhang, Peng Zhang², and Craig Schlenoff

The IEEE Robotics and Automation Society's (RAS) standards working groups continue to grow. We have four published standards:

- 1872–2015: Core Ontologies for Robotics and Automation
 - 1872.2–2021: Standard for Autonomous Robotics Ontology
 - 1873–2015: Robot Map Data Representation for Navigation
 - 7007–2021: Ontological Standard for Ethically Driven R&A Systems
- and nine active working groups:

- 1872.1: Robot Task Representation (standard expected in 2023)
- 1872.3: Ontology Reasoning for Multiple Autonomous Robots
- 2751: 3D Map Representation for Robotics and Automation (standard expected in 2023)
- 2817: Guidelines for Verification of Autonomous Systems
- 2940: Measuring Robot Agility
- 3107: Terminology for Human–Robot Interaction (HRI)
- 3108: Recommended Practice for HRI Design for Human Subject Studies
- 3140: Semantic Map for Autonomous Robot
- 7008: Ethically Driven Nudging.

Over the past few months, we have introduced three new working groups, described below.

TWO ELECTRIC VEHICLE CHARGING STANDARDS WORKING GROUPS

At the end of 2020, there were 10 million electric cars on the world's roads,

Digital Object Identifier 10.1109/MRA.2023.3237468
Date of current version: 22 March 2023

and by June 2022 there were about 20 million new energy vehicles globally. With the popularity of electric vehicles (EVs), people's demand for convenience and intelligence of charging facilities is increasing. At an intelligent charging facility, an EV charging robot can replace manual charging operation and not be restricted by location and power capacity, like traditional charging stations currently face.

According to recent information, products and prototypes of EV charging robots have been developed and applied in China, the United States, Germany, South Korea, and other countries. At present, there are various technical routes of charging robots, with different volumes, weights, appearances, functions, and application scenarios. Due to the lack of relevant technical guides, the existing EV charging robots have some problems, including:

- The lack of common terms and definitions leads to conceptual confusion and misunderstandings, which reduces the efficiency of communication between different countries.
- The lack of a common classification method brings inconvenience to technical comparison, and the characteristics of different technical routes cannot be clearly distinguished.

- The lack of general technical requirements on functions or performances leads to no unified reference basis for design, research, development, production, and management, which is not conducive to making decisions and ensuring the basic practical needs of users.

To solve the above problems, the goal of the Electric Vehicle Charging Robot Terminology and Classification (CRTC) Working Group is to provide a common set of definitions and terms and develop a unified classification of EV charging

robots. The goal of the EV Charging Robot General Requirements (CRGR) Working Group is to put forward general technical requirements of basic functions and main performance, to provide a reference for the design, production, and management of EV charging robots. To date, the two working groups have over 30 members, consisting of a cross section of charging service providers, automobile manufacturers, academia, and users. In

the future, the number of working group members is expected to exceed 40, representing at least three countries.

Membership in the two working groups is available for anyone who is interested in EV charging robots. If the reader would like to join, please send

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an e-mail to Lei Yang, the contact of CRTC, at hhhheee1@163.com, or Yifei Hu, the contact of CRGR, at frederick1207@163.com to request to be added to the list of participants.

P3177: FRAMEWORK OF MODULARITY FOR ROBOTICALLY ASSISTED SURGICAL SYSTEM WORKING GROUP

The purpose of the Framework of Modularity for Robotically Assisted Surgical System standard (RASS) is to define a modular framework for a RASS. This framework includes interconnected modules and focuses on the

connection between modules. This standard will propose the interface and interaction requirements between modules to allow modules to be flexibly combined and replaced to meet the requirements of different surgical operations. The standard also helps enterprises, especially small/medium-sized enterprises and start-ups, which develop robot-assisted surgical equipment to provide more universal modules and submodules to meet market needs.

There are currently 17 voting members from government, industry, hospitals, and academia; 23.5% of the members are from the medical industry,

11.7% are from government, and 64.8% are from academia.

Membership in the working group is available for anyone who is interested in robotically assisted surgical systems. If the reader would like to join, please send an e-mail to Lihai Zhang, chair (zhanglihai74@qq.com), or Peng Zhang, secretary (starzhly@163.com) to request to be added to the list of participants.

Apart from the new working groups, requests about the other IEEE RAS standards efforts can be directed to Craig Schlenoff, RAS standards chair, at craig.schlenoff@nist.gov.

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FROM THE EDITOR'S DESK (continued from page 4)

Sheng led the SI effort and managed the peer review process together with Guest Editors Hesheng Wang, Yingzi Lin, Yasuhisa Hirata, and Stefano Mazzoleni. I'd like to thank them for their dedicated service. The first article of the special issue is open access, and it summarizes the research findings of a project funded by the government of Japan. We hope this special issue increases the awareness and visibility of robotics research on homecare.

As usual, in this first issue of the year, I would like to welcome the new Associate Editors, Chao Jiang, Cunjia Liu, Maria Pozzi, Alberto Pretto, and Chen Wang, to join the editorial board. I would also like to express my gratitude and appreciation to the retiring RAM AE, Yue Wang, for her dedicated service to RAM.

THE MAGAZINE REDESIGN

You may have noticed that your print issue of *RAM* has a new look. This is a result of a comprehensive redesign to enhance the presentation and make the magazine more visually appealing. The IEEE Publication team, led by Janet

Dudar and Peter Tuohy, has worked diligently on the new design for more than six months. Some of the thought behind the redesign is to update the magazine to a more contemporary look. There are a lot of details to get right, and establishing a new look that is clean looking begins with the cover and ends with the last page of editorial content. Fonts were carefully chosen based on readability. The front of the magazine shows a new table of contents format, indicating the type of different features and giving more descriptive information on the subject matter of each article. The columns and departments sport a refresh as well, with the use of rules and new fonts. The overall design shows elements that carry through the entire magazine, making it a cohesive brand.

In addition, *RAM* will have a new digital edition with a website to be launched soon. The digital edition provides a deeply engaging reading experience and is mobile friendly. We hope to make good use of the media and increase visibility of your research results. Prepare your robotics videos with good quality, and we will feature them on the website.

The redesign was supported by the IEEE Robotics and Automation Society (RAS) leadership and the Publication Activities Board. I would like to thank Frank Park, RAS president, for inspiring us with redesign ideas. The redesign is a team effort, and I'd like to thank the committee members, Todd Murphey (vice president of publication activities), Bram Vanderborcht (vice president of media services), Jindong Tan (*RAM* editor), and the supporting RAS staff, Amy Reeder and Paul Goldberg, who have spent many hours meeting with the redesign team and providing feedback on the mockups and the website.

We hope you enjoy this new look while reading the magazine.

REFERENCES

[1] "The pandemic shows the urgency of reforming care for the elderly: Most people should be helped at home as they age", *Economist*, Jul. 2020. [Online]. Available: <https://www.economist.com/international/2020/07/25/the-pandemic-shows-the-urgency-of-reforming-care-for-the-elderly>

[2] Q. Zhao et al., "Gait monitoring for older adults during guided walking: An integrated assistive robot and wearable sensor approach," *Wearable Technol.*, vol. 3, Oct. 2022, Art. no. e28, doi: 10.1017/wtc.2022.23.

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