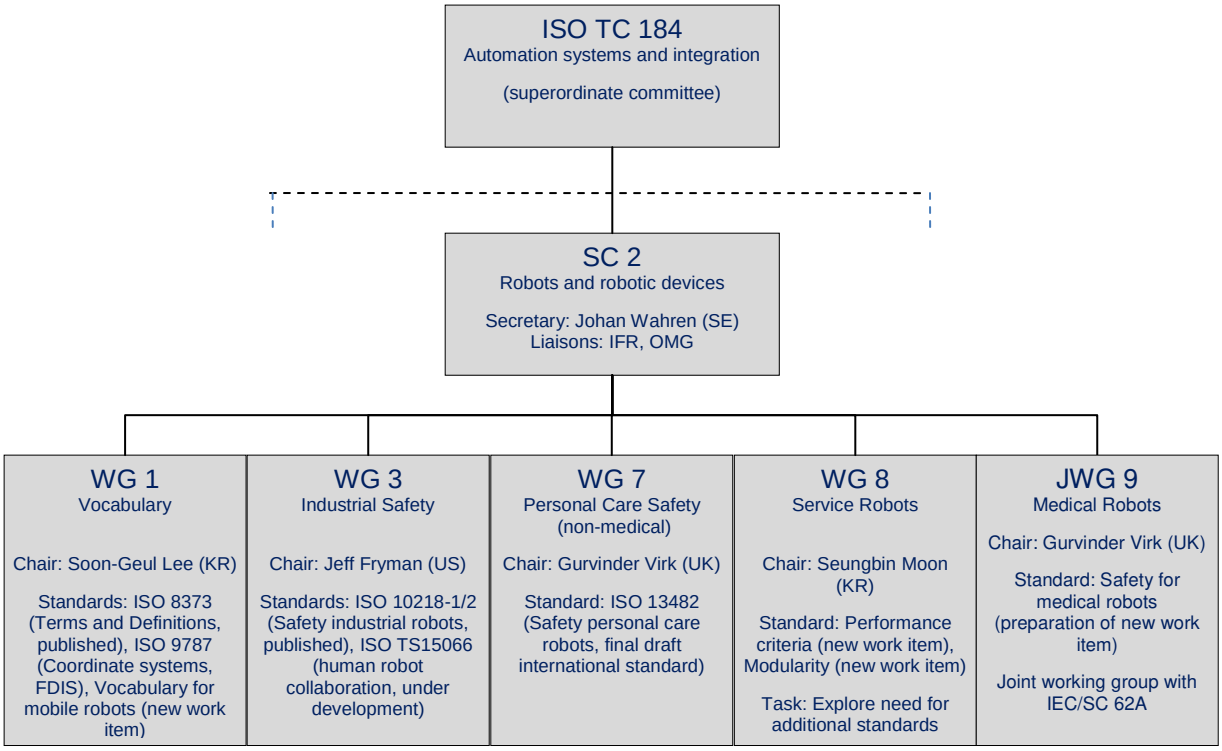
Newsletter: Standardisation Efforts on Industrial and Service Robots

Industrial robots have been part of industrial automation for a long time and are thus covered by several international standards such as the current ISO 10218[1]. As tasks for industrial robots have gotten more complex, e.g. collaboration with workers, new standards are currently being developed. New standardisation efforts have also been started on service robots for medical and household applications in order to specify general safety requirements before serial products enter the market.

Within the EU-funded project euRobotics, standardisation efforts on robot safety are promoted and effectively communicated among stakeholders. EURON and EUROP members will be informed about current developments in ISO standardisation committee TC 184/SC 2 “Robots and robotic devices” on a regular base. Also, working groups of the relevant ISO Technical Committee TC 184 “Automation systems and integration” are open for contributors and experts are encouraged to participate.[2]

Organisation of Standardisation Committees

All standard development related to robots takes place in ISO TC 184/SC 2 committee and is organized in five working groups (see figure below). During the year 2012 a study group on modular robot design was founded inside WG 8.



[1] http://www.iso.org/iso/search.htm?qt=10218&searchSubmit=Search&sort=rel&type=simple&published=on

[2] For more information regarding possible participation in TC 184/SC 2, please contact: theo.jacobs@ipa.fraunhofer.de

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Standards are developed through the instrument of "commenting": During balloting periods, which are held regularly, each national standardization organization has the possibility to write comments proposing to change, delete or add text to the standard. In the international meetings these comments are resolved in discussion and agreed changes are applied to the document.

Nations that are currently actively participating in developing these standards are: China, France, Germany, Italy, Japan, Korea and United Kingdom. WG 3 gets additional contributions from Canada, Sweden, Switzerland and the United States. The working groups usually meet three times a year in different locations in the USA, Europe and Asia. Meetings of the SC 2 committee are held every two years.

Further information is available at the ISO Website[3].

Progress in WG 1 – Vocabulary and coordinate systems

Chair: Soon-Geul Lee (Korea)
Standards: ISO 8373 – Robots and robotic devices – Vocabulary (published)
ISO 9787 – Robots and robotic devices – Coordinate systems and motion nomenclatures
Vocabulary for mobile robots (final draft international standard)

After ISO 8373 has been published, WG 1 is working on additional standards with terms and definitions for specific robot types. Currently, a new work item on vocabulary for mobile robots containing e.g. definitions for locomotion mechanisms and navigation algorithms is prepared.

In addition to standards on vocabulary, the revised standard ISO 9787 dealing with the definition of coordinate systems for robots has now reached FDIS stage which means that no more technical changes will be made until the publication. The former standard for industrial robots has been extended by coordinate systems for service robots. Publication can be expected until the end of 2013.

Progress in WG 3 – Industrial safety

Chair: Jeff Fryman (USA)
Standards: ISO 10218-1 – Robots for industrial environments – Safety requirements – Part 1: Robot (published in 2011)
ISO 10218-2 – Robots for industrial environments – Safety requirements – Part 1: Industrial robot system and integration (published in 2011)
ISO/TS 15066 – Technical specification on collaborative workspace (under elaboration)

In WG 3 work on the technical specification ISO/TS 15066 continued. The technical specification contains limits for impact forces and pressures which might lead to an injury in case of collisions. Values are taken from medical literature as well as from practical tests on pain tolerance levels. At the last meeting, the methodology for test procedures that validate that acceptable force and pressure limits are not exceeded was further developed.

Progress in WG 7 – Personal Care Safety

Chair: Gurvinder Virk (UK)
Standard: ISO 13482 – Robots and robotic devices – Safety requirements for service robots – Personal care robot (Final Draft International Standard)

[3] http://www.iso.org/iso/standards_development/technical_committees/other_bodies/iso_technical_committee.htm?commid=54138

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After the first DIS balloting had resulted in massive changes in structure and content of the draft document of ISO 13482, it was decided to have second DIS balloting to allow all participating countries to vote on a document that is as close to the finally published standard as possible. In an international meeting in October 2012 in Seoul, all comments for the second DIS balloting were resolved and the document was prepared for FDIS voting. This means, that from now on no more technical change will be made. Only editorial changes will be possible from now on. The FDIS balloting will start in January or February 2013. The final standard will be published in the middle of 2013.

Progress in WG 8 – Service robots

Chair:	Seungbin Moon (Korea)
Task:	Determine need for additional standards for service robots
Standards:	Performance criteria for mobile service robots
	Modularity

Apart from writing standards, WG 8 has the task to monitor standardization activities in other organizations such as OMG and IEC and to explore the demand for new ISO standards in the area of service robotics. In 2011, WG 8 started a new work item on performance criteria for mobile robots such as velocity of a mobile robot, precision of positioning as well as the ability to travel up ramps. The standard will focus on performance criteria which are not safety related in order not to interfere with the work of WG 7.

In 2012, a new study group inside WG 8 was formed with the task to prepare a new standard on modularity. The working group met at the international meeting in Seoul in October 2012 for the first time. An initial proposal defines basic principles for modularity and addresses modularity of software on different implementation levels as well as of hardware.

Progress in JWG 9 – Medical robot safety

Chair:	Gurvinder Virk (UK)
Standard:	IEC 60601-2-x (Evaluation of new work item)

JWG 9 is a joint working group in cooperation with IEC/SC 62A. The working group continued the evaluation of a new standard on the safety of medical robots which will be added as a part of IEC 60601-2. To prepare the standardization process, initial concepts, e.g. the definition of autonomy, are being developed which will be the foundation for a future safety standard for medical robots.

Possibilities to get involved in standardization work

For the European academia/research and industry it is crucial to participate in all standardization working groups with a sufficient number of technical experts. Only by doing so, innovations and products will be considered during the standardization process and latest research results can be incorporated in the standard.

Encouragement to attend international meetings

Technical experts who attend international meetings, vote in international balloting procedures and write comments to propose changes in the documents are appointed by the national standardization organization of their respective country. In order to get nominated, interested persons from industry or research institutes should contact their national standardization body to ask for details. Apart from formal contribution as a technical expert, it is also possible to visit a meeting as an observer.

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Observers are also formally appointed by national standardization organizations, but do not have the right to participate in official balloting.

The next international meetings are planned as follows:

- January 28 - February 7, 2013: Subsequent meetings of WG 1, 7, 8 and JWG 9 in San Francisco, USA
- February 18 – 20, 2013: Meeting of WG 3 in Orlando, Florida, USA
- June 2013: Subsequent meetings of WG 1, 7, 8 and JWG 9 in Bristol, UK
- October 2013: Subsequent meetings of WG°1, 7 8 and JWG°9 in Beijing, China

Contributing to national mirror committees

When several experts from one country participate in standardisation, a national mirror committee can be formed. In these national committees homework and comments for the international meetings are coordinated and results from the international meetings are disseminated to the national community. Even if no mirror committee has been formed yet, it is possible for interested technical experts to contribute to standardization on a national level without attending the international meetings, for example by making comments for an international balloting.

Compiled and written by

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