

Casey Bean, Jens Bennedsen,
Kristina Edström, Ron Hugo, Janne
Röslof, Robert Songer & Tomohito
Yamamoto (eds.)



The 14th International CDIO Conference

Proceedings - Full Papers



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Editorial

The CDIO approach is an innovative educational framework for producing the next generation of engineers. The aim is an education that supports students in the acquisition of strong technical fundamentals while simultaneously developing the necessary professional skills required of a practicing engineer. This is done by providing students with dual-impact learning experiences that are based upon the lifecycle of an engineering project, the Conceiving - Designing - Implementing - Operating (CDIO) of real-world products, processes, and systems. Throughout the world, more than 150 institutions have adopted CDIO as the framework of their curriculum development.

The Annual International Conference is the main meeting of the CDIO Initiative and it includes presentations of papers as well as special seminars, workshops, roundtables, events and activities. The 14th International CDIO Conference takes place in Kanazawa, Japan, June 28 - July 2, 2018, hosted jointly by Kanazawa Institute of Technology and International College of Technology, Kanazawa. The organizers together with the city of Kanazawa welcome you to the event!

The main theme of this year is *Innovations in Engineering Education*. It is visible in the keynote presentations, paper presentations, roundtables and workshops. The rich topical program will facilitate lively discussion and contribute to further advancement of engineering education.

The conference includes three types of contributions: Full Papers, Learning Objects, and Projects in Progress. The Full Papers fall into three tracks: Advances in CDIO, CDIO Implementation, and Engineering Education Research. All contributions have undergone a full single-blind peer review process to meet scholarly standards. The Learning Objects contributions provide resources for specific teaching and learning activities and describe them in detail. The Projects in Progress contributions describe current activities and initial developments that have not yet reached completion at the time of writing.

Originally, 195 abstracts were submitted to the conference. The authors of the accepted Full Paper, Learning Objects, and Projects in Progress abstracts submitted 114 Full Paper manuscripts to the peer review process. During the review, 401 review reports were filed by 85 members of the 2018 International Program Committee. Acceptance decisions were made based on these reviews. The reviewers' constructive remarks served as valuable support to the authors of the accepted papers when they prepared the final versions of their contributions. We want to address our warmest thanks to those who participated in the rigorous review process.

This publication contains the 80 accepted Full Paper contributions to be presented at the conference, of which 4 are Advances in CDIO, 65 are CDIO Implementation, and 11 are Engineering Education Research. These papers have been written by 256 different authors representing 25 countries. This book is available as an electronic publication only. In addition to the Full Papers, 1 Learning Objects contribution and 33 Projects in Progress contributions are to be presented at the conference and are not included in this publication.

We hope you find these contributions valuable for your own research, curriculum development, and teaching practice, ultimately furthering the engineering profession. We also hope that you benefit through the truly unique community of practice that exists within the CDIO Initiative. More than 100 institutions from 32 countries, representing 6 continents, will be present at the conference. Seize the opportunity to discuss and share with colleagues, as global awareness and partnerships are of major importance in the education of the next generation of engineers.

Wishing all of you a wonderful CDIO 2018 experience!

Kanazawa, June 6, 2018

Casey Bean

Jens Bennedsen

Kristina Edström

Ron Hugo

Janne Roslöf

Robert Songer

Tomohito Yamamoto

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