

Jens Bennedsen, Kristina Edstrom,  
Maria Sigridur Gudjonsdottir,  
Ingunn ScEmundsdóttir, Natha Kuptasthien,  
Janne Roslof & Angkee Sripakagorn (eds.)



**CHULA ENGINEERING**

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# The 17<sup>th</sup> International CDIO Conference

## Proceedings - Full Papers





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# Editorial

The Annual International Conference is the key event for the CDIO community where CDIO practitioners from all over the world come together, share knowledge and promote the advancement of the practice of the CDIO framework for producing the next generation of engineers. The last event in 2020 was organized by Chulalongkorn University and Rajamangala University of Technology Thanyaburi and was planned to take place in Bangkok, Thailand. However, due to the pandemic situation, the conference was rearranged as an online conference hosted by Chalmers University of Technology, Sweden. The organizers from CDIO Thailand would like to thank Professor Johan Malmqvist and the CDIO office for facilitating the (online) sharing and social gathering to benefit the CDIO community even with such short notice.

For the present 17<sup>th</sup> International CDIO conference, the organizers readily realized that the event is to be held under the new normal circumstances. The local organizers, from the outset, intended to offer a satisfying online conference experience and a paper review with high quality. With as strong as ever support from our international program committee, we believed we had delivered on our intentions, as you can attest from the conference proceeding and the experience within the conference.

The conference covers three types of contributions; full papers; project in progress papers, and activities, allowing participants with different depth of expertise from different technological disciplines to share and learn under a common language of the CDIO syllabus and 12 standards. All contributions passed a complete single-blind peer-review process to ensure scholarly standards. From the initial 139 submitted contributions from 23 countries, 108 manuscripts arrived to go through the peer-review process participated by 92 members of the 2021 International Program Committee. The constructive remarks and numerous encouragements from reviewers to authors and even the organizing committees in this tough time of global pandemic served as a reminder of strong partnership within the CDIO community. We cannot be thankful enough for those who supported the rigorous standard of the review process.

The theme of this year was Reimagining Engineering Education in the New Normal. Education is as vital as ever as engines of economic development, as discussed in a roundtable session. From a keynote presentation and roundtable sessions, the participants were presented with pragmatic and systematic ways to transform the University context to address more effectively the societal need in the new normal trailed after the pandemic event. After all, the reimagining also comes down to educators/academics to come together as a community being bounded to a common language via the 12 Standards; keep improving and innovating and being agile as discussed in a keynote presentation, full papers and roundtable sessions during the event. Reimagining is not limited to universities and academics. The CDIO framework itself is continually rethought, as presented in an Advanced in CDIO paper. As a result of collaborative efforts and multiple reviews, Optional Standards was presented in a roundtable session.

This publication includes 66 full paper contributions, among which 49 are in the CDIO Implementation section, 6 are Advances in CDIO section, and 12 in Engineering Education Research section. During the event, participants can also learn about 12 Projects in Progress contributions documenting current developments or initiatives worth sharing yet had not reached archival capacity at the time of writing. In addition to individual contributions from authors, the Annual International Conference provided a range of activities to cater to social gathering opportunities and collaborative contributions in Workshops, Roundtable Discussions and Working Groups. Participants are encouraged to join in these activities to expand their view and experience and make the collaborative contributions even more robust for the CDIO community.

The pandemic may have disconnected us physically. Nevertheless, we are ever more connected via CDIO activities!

Bangkok, June 21, 2021

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