



INDUSTRY CLUB

industryclub.control.lth.se // newsletter No 3



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The Automatic Control Industry Club: Exploring, Expanding and Applying Control Technology

Welcome to Newsletter Nr 3, February 2022

In the newsletter we present interesting new developments at our department, report about advances in the field of automatic control, as well as opportunities for collaborations.

We welcome you to be a part of this!

Industry Club

The Industry Club is an initiative to build an ecosystem around the Department of Automatic Control at Lund University. We want the Industry Club to be a forum for sharing ideas and getting feedback on the research we do. We want to reach out to the industry and other organizations to collaborate on new projects and initiate new research collaborations. The interface of the Industry Club will be a recurring newsletter, a webpage, and online and live events.

Highlights from the department

Interesting topics are being discussed on a daily basis at the department. Here are a few examples of recent topics that we would like to highlight.

- *CDC contributions from the Department.* CDC, the conference on decision and control, is one of the major annual control conferences and, was held in December 2021. Our department presented 9 papers on the topics nonlinear control, robust control, network dynamics, predictive control, drone control, optimal control and covid interventions. The department co-organized and/or co-chaired 7 sessions covering robust control, large scale systems, optimal control, constrained control and network systems.
- *Temperature Estimation for Electric Motors* in Battery Electric Vehicles Permanent-magnet synchronous motors (PMSMs) is used in electric vehicles. For the control system, it is important to consider the temperature of the rotor during operation. Together with BorgWarner Sweden AB in Landskrona, our MSc student Daniel Mårtensson is investigating model-based temperature estimation using observers, with the aim of

avoiding direct temperature sensing since it is both technically challenging and implies higher costs.

- *Standards of Gold - how standardization has strengthened the industrial sector.* Globally accepted industrial standards are crucial for industrial adoption of new products and services as they serve as the foundation for new innovations. This is especially true when it comes to products and services in Smart Industry (or Industry 4.0, as it is also called). The research project “Standards and Strategies for Smart Swedish Industries (4S)”, published a report targeting decision makers in Swedish industry. It highlights the values that industrial and international standards have had, currently have, and will continue to have, for our Swedish industry. A conference will be organized in late spring. The report is available for [download](#), and printed versions can be sent to you upon request, please contact [Charlotta Johnsson](#).



Highlights from the control world

We frequently attend control conferences, events and meetings around the globe. Below you'll find a glimpse of what we consider the most valuable take-aways.

- *Societal Impact.* Research done at the department has influenced organisations and companies around the world, and we call that Societal Impact. The societal impact may be local, national, or international and may occur on very different time frames, from years to decades. It is important to understand how, why, and when, our research leads to societal impact. Projects at the department are encouraged to identify one or more of the sustainable development [goals](#). Two examples are “Using control theory for anaesthesia and organ transplantation” and “From performance indicators for manufacturing operations to international coordination” which were able to make a difference. Find out more on our [webpage](#).



- *Construction Robotics.* One rather new direction in the field of robotics, is the use of robots in building construction. As a result, a new center is formed [The Center for Construction Robotics](#). The partners are our department together with colleagues from the division of Structural engineering, the School of Architecture, LTH and companies like AChoice, Peab, Skanska, Cognibotics and Fojab. In the figure, a Boston Dynamics' Spot is currently used for visual SLAM, scanning, and inspection on [a construction site at Vipeholm](#), Lund. The automatized inspection scans by Spot continuously follow the progress of the construction work and, based on reconstructed dense maps compared to blueprints, allow for early misalignment detection to minimize construction errors and log the actual progress.



Upcoming opportunities

- *Participate in our new course.* The new course “[Modeling - from Physics to languages and Software](#)”, given by Prof Emeritus Karl Johan Åström, is open for industrial participants and is free of charge. The course will be held at the Department starting in week 14 (early April) 2022. To register, or ask questions, please contact [Bo Bernhardsson](#).
- *Industry club day – March 24, 2022!* We are planning for an Industry Club Day on March 24, 2022, at 16-18. This will be an event aimed for networking and sharing of ideas and thoughts. The program will contain round table discussions and networking, among other things. We hope to meet you all – welcome! See more details on the [website](#)

HAPPY SPRINGTIME!

Contact



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