



# INDUSTRY CLUB

industryclub.control.lth.se // newsletter No 1



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

Welcome, to the first issue of our Newsletter.

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

## Industry Club

The Industry Club is an initiative to build an ecosystem around the Department of Automatic Control at Lund University. We have created this as a way to share ideas and get 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 questions. The interface of the Industry Club will be a recurring newsletter, a webpage, and online and live events.

## Collaborations

We have many collaboration activities with external partners. A common form is through master's thesis projects where we interact with both small start-ups and large companies and organizations, e.g., Tetra Pak, ABB, E.ON, etc. We also have a set of larger projects, often including industrial PhD students, with companies like SAAB, Axis Communications and Ericsson, where we work together on more long-term challenges. Other types or organisations that we interact with are the European Space Agency and Region Skåne. We work closely with our spin-off companies, e.g., Modelon and Cognibotics, to bring research results to the market. Through our participation in large Swedish industry-academic research programs, such as the strategic research environment ELLIIT and the Wallenberg-funded WASP organization, we work closely with other leading Swedish universities.

These collaborations give us and our partners great opportunities for technology transfer, both from theory to applications, as well as between different application domains.

We welcome you to be a part of this!

## 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.

- *Control for solving Covid-related questions Learning.* During the past year, several of us have worked on covid-related questions. One line of work, on the difficulty of precise modelling and identification, has been published in [Nature](#). A second line of work, presented in the video linked to below, uses control-theoretic methods to estimate the amount of testing needed to have an impact on the spreading of the virus. You can watch it here: [Covid-Testing](#) by Richard Pates.
- *Learn more about Scientific Machine Learning.* The term Scientific Machine Learning has been used in recent years to refer to work that combines machine learning, in the form of neural networks, with dynamical systems, often in the form of differential equations. There are many potential applications in the area of automatic control and the related software ecosystem is growing. One example application on system identification is presented in a [seminar](#) by Mattias Fält.
- *How can control be used to improve our wind-power systems?* As electricity production moves from hydro- and nuclear-power to wind-power, the benefits of the former in stabilizing the oscillation-frequency of the power grid are lost. Johan Lindberg has investigated how we might use wind turbines for active frequency control to obtain some of those benefits with wind-dominated power production. Read more about his master's thesis work [here](#).

- *Best Paper award!* Our PhD-student Nils Vreman received the best paper award at ECRTS 2021, for the paper “[Stability and performance analysis of control systems subject to bursts of deadline misses](#)”.
- *Curious about what happened at the department in 2020?* Our [annual report](#) for year 2020 is ready and published. Here, you can read all about last year’s activities (education, research, collaborations etc) at the department. Our collaborators are listed in the External Contacts-section – is your company there?
- *You’re welcome to attend our upcoming PhD defences.* During the fall, two of our PhD-students Marcus Greiff and Per Skarin will defend their theses. You are most welcome to attend the events and learn about their work. More info is available at the [homepage](#).
- *Do you know a suitable PhD-candidate?* The next call for new PhD-candidates is now open. Last day to apply is 23/10-21. More info about the call.
- This autumn, 19 new students started the master program in “[Machine Learning, Systems and Control](#)” out of more than 600 applicants. The program is managed by Mikael Nilsson (math) and Bo Bernhardsson (control).

## Highlights from the control world

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

- *Control for Societal-Scale Challenges.* At a workshop at KTH, Stockholm, in June, a scientific roadmap for the future of control discipline was developed, called [Control for Societal-Challenges Roadmap 2030](#). The objectives of the roadmap are to outline new societal areas where control theory can have an impact, as well as to identify challenges and what is needed in order to best address them. The website contains recordings from the June 2021 event. A follow up workshop is planned for June 2022.
- *An interesting intersection.* Many more discussion on the intersection between Control and Learning, e.g., such as the IFAC 2020 panel discussion on “[Control and learning is there really a divide?](#)”

## Upcoming opportunities

- There are currently many students looking for master thesis projects in the area of control and machine learning. Send suggestions to [anton.cervin@control.lth.se](mailto:anton.cervin@control.lth.se). Note that this autumn the first batch of students from our international master program will be looking for such projects.
- *Match making event with machine learning master students.* The master program in machine learning, systems and control at Lund University was inaugurated in 2020. As a combination of high application count and a limited number of spots, it engages very talented and ambitious students. We would hereby like to invite you to a match making event, Nov 5, 10-12, to provide your company the opportunity to work with the students, and vice versa. If you have projects during the summer that would make a suitable internship or projects during the spring that would make a suitable master thesis (co-supervised by a faculty member from the department of automatic control), we would be very happy to hear you present these to the students at the event. We plan to host the event physically on campus, with a zoom option for those who cannot attend in person. For further inquiry please don’t hesitate to contact Kristian Soltesz at [kristian@control.lth.se](mailto:kristian@control.lth.se).
- The next round to apply for WASP funded industrial PhDs will open in a few months from now. This gives companies a chance to let a suitable employee become a WASP-funded PhD-student at our department. A win-win situation for our department, as well as your company. Contact us already now if you are interested to learn more.

## Contact

More information about the department and our activities is available on our [webpage](#). If you would like to receive more newsletters along with invitations to our events, please sign up at the [Industry Club website](#). If you would like to contact us to discuss collaborations of any kind or if you want to unsubscribe to the newsletter, please send an email to [contact.industryclub@control.lth.se](mailto:contact.industryclub@control.lth.se).