

Carolina Bergeling née Lidström

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About me: I am a senior lecturer (universitetslektor) at the Faculty of Engineering, BTH, since January 2022. My research interests are within the analysis and control of complex systems as well as geometry-based statistical methods for signal processing. Applications range from marine technology to real-time decoding of a human's intent through EEG measurements of her/his brain.

Previous research positions and visits

Postdoc – Dept. of Automatic Control, Lund University July 2019–Dec 2021*

Project title: Real-time Individualized Brain Computer Interfaces, *PI:* Prof. Bo Bernhardsson
Work duties included research, teaching, supervision, project planning and administration, and writing funding applications.

**Parental leave:* 100% August – September 2019 and March – August 2020, 50% September – December 2020 and 20% January 2021 – June 2021.

Visiting researcher – University of Minnesota Sept – Oct 2015, May 2016

Institute for Mathematics and its Applications, University of Minnesota, Minneapolis, USA.
Thematic year on control theory during which I attended workshop, gave poster-presentations and worked with both permanent and visiting staff.

Education

Ph.D. in Automatic Control – Lund University June 2013 – June 2019*

Advisors: Professor Anders Rantzer, Professor Bo Bernhardsson and Dr. Richard Pates

Thesis topic: H-infinity Control of Large-Scale Systems

Degree includes 120 ECTS in pedagogical training, control theory, optimization, mathematics, biology and physics. Worked 20% with teaching and other departmental activities.

**Parental leave:* June 2018–January 2019

M.Sc. in Engineering Physics – Lund University August 2008 – May 2013

Specialized in bioengineering and automatic control. Master's Thesis in automatic control.

Exchange – University of California, San Diego August 2011 – June 2012

Exchange during M.Sc. in Engineering Physics. Specialized in Bioengineering and Neuroscience. Internship in Bioinformatics at *the Scripps Research Institute* during the spring of 2012.

Leadership, outreach and service

Besides taking great organizational responsibility as a supervisor and researcher, I have initiated and led a project to evaluate the current state of supervision given at the Department of Automatic Control, Lund University. It resulted in actions taken on several levels of the supervision procedure. Furthermore, I have co-founded and organized working groups on gender equality and diversity that arrange seminars and discussion sessions to raise awareness on gender equality and diversity for students and employees at Lund University.

Reviewer for Automatica, IEEE Transactions on Automatic Control, IEEE Control Systems Letters, IEEE Conference on Decision and Control, American Control Conference, European Control Conference, IFAC World Congress, L4DC. Also, reviewer at preparatory seminar of PhD students work, 9 months before defence, at the Dept. of Automatic Control, Lund University. **Public outreach:** Informed the public about the engineering discipline in general and the field of Automatic Control in particular during events such as *Kulturmatten* and *Her tech future* (organized by the city of Lund and The Engineering Faculty at Lund University, respectively). Given several talks on what it is like to do a PhD on events hosted by Lund University.

Teaching, supervision and pedagogical training

Given lectures, constructed material for exercise sessions, exams and supervised weekly tutorials as well as projects in several basic, advanced and PhD-level courses (e.g. Robust Control, Hands-on Machine Learning, Network Dynamics). Co-supervised Master's thesis projects (6 completed (one of which won prize for best Master's thesis in Engineering at Lund University during 2020)). Completed 10 ECTS of pedagogical training. Co-supervisor of PhD-students:

- Frida Heskebeck, since August 2019, on real-time classification of EEG signals and calibration of BCIs,
- Emil Vladu, since January 2020, on distributed control of large-scale non-linear systems,
- Pex Tufvesson, since January 2021, on EEG and music imagery,
- Martin Gemborn Nilsson, since January 2021, on Riemannian Geometry for visualization and transfer learning in EEG-based Brain-Computer Interfaces.

Supervisor of student project together with Saab Kockums AB on the fully autonomous and modular surface vessel Stingray. Submitted to the James Dyson Award (<https://www.jamesdysonaward.org/en-GB/2022/project/stingray/>).

Conferences, Workshops and presentations

Presentations at CDC 2016, 2017, ACC 2016, IFAC World Congress 2017, MTNS 2018 (presented by co-author due to on parental leave), Reglermöte Göteborg 2016, IMA Workshops 2015 and 2016. **Co-chair** at LCCC Linnaeus Center Workshops, Lund, 2014 and 2017. **Invited speaker** to Potioc research group, inria, Bordeaux, France, March 25, 2021.

Other skills and competences

Languages: English (advanced), Swedish (native), French (basic)

Skills: Python, MatLab, L^AT_EX, Java, Mathematica

Publications

For a list of publications, click here.

References

References and certificates are available upon request.