Karl Lundengård

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More details and examples of work can be found at https://www.karllundengard.se/cv/cv.html

Profile

Applied mathematician interested in interdisciplinary work with focus on developing mathematical or computer-based tools to mitigate or solve specialised problems in cooperation with specialists in other fields.
PhD in applied mathematics, has done research with intended applications in electrical engineering, demographics, pure mathematics and mathematics education. Years of professional experience with university level education for large and small groups, as well as developing supporting software of varying complexity.
Experienced in coordinating small groups with members of varying professional, cultural and ethnic backgrounds.
Enjoys learning new things, mainly about behind-the-scenes problems involving technology and/or communication.

Work experience

Lecturer — Mälardalen University (Västerås, Sweden)
Division of Applied mathematics — (50% employment) 03-2015 – 12-2019, (100% employment) 01-2020 – 01-2021

Teaching, organisation and examination of courses on a basic and advanced level. Subjects include mathematical physics, numerical methods, biomathematics and bioinformatics, quantum computing and information theory, applied matrix analysis. Co-supervision of two PhD candidates and supervision of a few master's thesis related to phenomenological modelling of e.g. electrostatic discharges or mortality rates.
Programme coordination for the master's programme in Engineering mathematics. Duties included: revision and development of the programme, creation of individual study plans, convening programme council and industry council, recruitment at a national and international level.

Research Associate — Imperial College London (London, United Kingdom)
Department of Mathematics — 07-2022 – now

Development of software for an online system for supporting independent study in mathematics-related subjects. Duties include: collecting, understanding and prioritising needs and feature requests from teachers in many different subjects, including pure mathematics, physics, various engineering fields and medicine. Designing and developing software that analyses student responses and produces feedback. Assisting in designing the interface between evaluation functions and web client.

Education

Ph. D. in Applied Mathematics — Mälardalen University, Västerås, Sweden, 01-2012– 09-2019

Included research in: optimization of the Vandermonde determinant and related expressions on various surfaces, curve-fitting of non-linear models for approximation of electrostatic discharges for use in electromagnetic compatibility, curve-fitting and comparison of non-linear models for approximation of mortality rates.

Master's degree of Science in Engineering, Engineering Physics — Lund University (Lund, Sweden)

Began autumn semester 2006, study break autumn 2008 – spring 2009, completed degree autumn 2011.
Spent the autumn semester 2010 as an exchange student at Queen's University (Kingston, Canada).
Master's thesis *Quantum Computation and Symplectic Codes*.

Research

Full list of publications: https://www.karllundengard.se/cv/publication_list.pdf

Doctoral thesis Mälardalen university, 2019

Extreme points of the Vandermonde determinant and phenomenological modelling with power exponential functions, Mälardalen University Press, https://urn.kb.se/resolve?urn=urn:nbn:se:mdh:diva-44579

Selected publications

Karl Lundengård, Peter Johnson, Phil Ramsden, *Automated Feedback on Student Attempts to Produce a Set of Dimensionless Power Products from a Set of Physical Quantities that Describe a Physical Problem*, International Journal for Technology in Mathematics Education, Volume 31, Number 3, pages 117–124(8) DOI: https://doi.org/10.1564/tme_v31.3.02, (2024)

Vesna Javor, Karl Lundengård, Milica Rančić, Sergei Silvestrov, *Analytical Representation of Measured Lightning Currents and Its Application to Electromagnetic Field Estimation*, IEEE Transactions on Electromagnetic Compatibility, Volume 60, Issue 5, pages 1415 – 1426, (2018).

Karl Lundengård, Milica Rančić, Vesna Javor, Sergei Silvestrov, *Electrostatic discharge currents representation using the analytically extended function with P peaks by interpolation on a D-optimal design*, Facta Universitatis Series: Electronics and Energetics, ISSN 0353-3670, Vol. 32, No 1, pages 25 – 49, (2019).

Andromachi Boulougari, Karl Lundengård, Milica Rančić, Sergei Silvestrov, Samya Suleiman, Belinda Strass, *Application of a power-exponential function-based model to mortality rates forecasting*, Communications in Statistics: Case Studies, Data Analysis and Applications, E-ISSN 2373-7484, Vol. 5, No. 1, pages 3 – 10, (2019).

Computer skills

Several years of experience working with Python, MATLAB and LaTeX.

Some experience with HTML, CSS, Javascript and C.

Familiar with GNU/Linux and Microsoft Windows.

Some experience with video conferencing software and video/audio editing.

Language skills

Swedish (native), English (fluent).

Non-professional interests

Regularly studies Russian (expected to reach A1 level during first half of 2025) and martial arts (blue belt in Brazilian jiu-jitsu with focus on self-defence).

Learning about autism and other forms of neurodivergence, particularly through autobiographies and case studies, as well as how to take cognitive processing differences (e.g. dyslexia, pragmatic language impairment or physiological impairments) into account in general communication and teaching.

References

Available upon request.