Marc Härkönen

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Education

Georgia Institute of Technology, Atlanta, Georgia, USA

PhD, Mathematics   2017–2022
- Thesis: Dual representations of polynomial modules with applications to partial differential equations
- Advisor: Professor Anton Leykin
- Cumulative GPA: 4.00/4.00; Minor in Probability and Statistics
- Research visits to ICERM (Brown University, Providence, RI), Institute of Statistical Mathematics (Tokyo, Japan), Sorbonne Université (Paris, France), Max Planck Insitute (Leipzig, Germany)

Aalto University, Espoo, Finland

Master of Science (Tech.), Mathematics   2015–2017
- Cumulative GPA: 5.00/5.00; Minor in Computational Science and Engineering
- Master's thesis: Holonomic Extended Least Angle Regression
- Advisors: Prof. Tomonari Sei (U. Tokyo) and Prof. Kaie Kubjas
- Exchange studies at the University of Tokyo.

Aalto University, Espoo, Finland

Bachelor of Science (Tech.), Mathematics   2012–2015
- Cumulative GPA: 4.96/5.00
- Bachelor's thesis: Distributed Storage Systems and Product Matrix Codes
- Advisor: Prof. Camilla Hollanti
- Exchange studies at the University of Hong Kong and Stanford University.

Professional Experience

Max Planck Institute for Mathematics in the Sciences, Leipzig, Germany

Postdoctoral researcher   may 2022–dec 2022
- Research in differential algebra and applications, in particular to solving systems of partial differential equations via algebra and computational aspects (Macaulay2 development).
- Mentored by Prof. Bernd Sturmfels; member of the Nonlinear Algebra research group.
- Collaboration with researchers in mathematical analysis and control theory.

CERN, Geneva, Switzerland

Summer trainee   jun 2015–sep 2015
- Data analysis of diffractive processes with 7 TeV and 13 TeV proton-proton collisions in the Large Hadron Collider.
- Particle identification in central diffractive processes with the ALICE collaboration.
- Used the ROOT data analysis framework (C++).

Aalto University, School of Chemical Technology, Espoo, Finland

Research assistant   jun 2013–sep 2013
- Research in the Novel Materials via Self-Assembly research group.
- Set up and ran molecular dynamics simulation using GROMACS, both locally and on high performance computational clusters.
- Programmed a C++ conversion tool for file formats used in molecular dynamics simulations.

Project Experience	**University of Minnesota & Securian Financial,** Minneapolis, MN

Math-to-Industry workshop (online)   jun 2021 - jul 2021
- Predicted group life insurance client mortality during a pandemic.
- Data gathering (US census bureau, CDC, USDA), cleanup and manipulation using R (tidyverse and tidymodels packages).
- Applied several machine learning models, evaluated them statistically, tuned and trained the best one.
- Gained experience in time series forecasting, model explanation methods and using Python in machine learning.

Software Proficiencies

Working knowledge
R (tidyverse, ggplot2, tidymodels), Python (numpy, scipy, pandas, matplotlib, keras, scikit-learn), Macaulay2, Mathematica, C++, Git, LATEX, Vim, Arch Linux, bash, Mac OS X, Microsoft Office Suite

Basic knowledge
HTML/CSS, Rust, C, Matlab, Julia

Leadership Experience

Max Planck Institute for Mathematics in the Sciences, Leipzig, Germany
Workshop organizer   2022
- Co-organized a three day academic workshop with 40 in-person participants and 20 online.
- Contacted speakers and coordinated with administrative staff regarding visa, hotel, streaming, and catering related issues.

Georgia Institute of Technology, Atlanta, GA
Seminar organizer   2020-2022
- Co-organized the Georgia Tech Student Algebra Seminar.
- Updated website, booked room, found and corresponded with speakers.
- During pandemic, successfully converted the seminar to an online format.

Georgia Institute of Technology, Atlanta, GA
Graduate Student Instructor   2017-2022
- Served as instructor of record for two courses: MATH-3670 - Probability, Statistics and Applications; MATH-2552 - Differential Equations.
- Prepared syllabi, computational examples, exams, exercises and delivered lectures in an online format.
- Lead a team of two teaching assistants (grading, tutorial sessions).

Honors & Awards

Outstanding Teaching Assistant, *Georgia Institute of Technology, Atlanta, GA*	2021
Outstanding MathLab Tutor, *Georgia Institute of Technology, Atlanta, GA*	2020
Chateaubriand Fellowship, *Embassy of France, Washington D.C.*	2019
SIAM student travel award, *Society for Industrial and Applied Mathematics*	2019
Vilho, Yrjö and Kalle Väisälä Foundation scholarship, *Finnish Academy of Sciences and Letters, Helsinki, Finland*	2019
Bob Price Travel award, *Georgia Tech, School of Mathematics, Atlanta, GA*	2018
Commendable Service as Electronic Warfare NCO, *Air Force Academy, Tikkakoski, Finland*	2012

Language Skills

Fluent/native: English, Finnish, French
Intermediate: Japanese
Basics: Cantonese, Mandarin, Swedish, Portuguese, Russian