Curriculum Vitae

Personal Data

Name	Matthias Himmelmann
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Education

03/2021 – today	**Universität Potsdam,** Potsdam, Germany Ph.D. in Mathematics, graduate student at the **Berlin Mathematical School** *Provisional thesis title*: Framework Mechanisms and Algebraic Geometry
07/2023 – 08/2023	Research Stay at the **Fields Institute,** Toronto, Canada in the context of the Focus Program on Geometric Constraint Systems
04/2018 – 12/2020	**Freie Universität,** Berlin, Germany M.Sc. in Mathematics (grade 1.1, GPA 4.0). Focus on Algebraic Geometry *Thesis*: Generalized PCA for Algebraic Varieties.
10/2014 - 03/2018	**Freie Universität**, Berlin, Germany B.Sc. in Mathematics (grade 1.2, GPA 4.0). Minor in Computer Science *Thesis*: Galois Groups and Fundamental Groups on Riemann Surfaces.
08/2017 - 12/2017	Erasmus semester abroad at **Universitetet i Oslo**, Norway
08/2004 - 06/2013	**Otto Hahn Europaschule**, Hanau, Germany Abitur (grade 1.3, GPA 4.0). *Advanced Courses*: Mathematics and Politics.

Professional Experience

03/2021 – today	**Research Assistant** Universität Potsdam, Germany • Managing the research group's website via the CMS Typo3 • Lecturer for *Mathematical Problem Solving* and *Algorithmic Algebraic Geometry*
05/2018 – 02/2021	**Student Assistant** Fraunhofer-Institut FOKUS, Berlin, Germany • Programming of features for early warning systems using Java/-Script • Design of a machine learning model for geospatial applications
08/2013 – 08/2014	**Federal Voluntary Service (Bundesfreiwilligendienst)** Deutscher Turner-Bund e.V., Frankfurt a.M., Germany • Event Management and Public Relations

Publications

2024, in preparation	Matthias Himmelmann and Gerd Schröder-Turk: *Disordered Minimal Surfaces.*
2023, Preprint	Alex Heaton and Matthias Himmelmann: *Computing Euclidean distance and maximum likelihood retraction maps for constrained optimization*.
2023	Matthias Himmelmann and Myfanwy Evans: *Robust Geometric Modeling of 3-periodic Tensegrity Frameworks using Riemannian Optimization*. SIAM Journal on Applied Algebra and Geometry.

Presentations

09/2023, Poster	*Riemannian Optimization and Algebraic Varieties – a Contradiction?* Conference on Applied Algebra, Universität Osnabrück, Germany.
08/2023, Talk	*Riemannian Optimization on Embedded Manifolds Using Homotopy Continuation.* Workshop on Constraint Systems: Distance Geometry, Structured Polynomials, Matrix Completion and Kinematics, Fields Institute, Toronto, Canada.
07/2023, Talk	*A Tetrahedral Tensegrity Model for Filament Packings.* Workshop on Geometric Constraints: Materials, Graphs and Matroids, Rigidity and Packings, Fields Institute, Toronto, Canada.
09/2022, Poster	*Towards a Robust Tensegrity Model for the Mechanics of Filament Packings.* The Interdisciplinary World of Tangling conference, Potsdam, Germany.
12/2020, Talk	*Generalized Principal Component Analysis for Algebraic Varieties.* Facets of Complexity: Monday Lecture and Colloquium, TU Berlin, Germany.

Software Projects

2023	DisorderedPointClusters.jl: Simulations for minimum energy point configurations.
2022	HomotopyOpt.jl: Riemannian optimization package for polynomial constraints.
2021	Implicit3DPlotting.jl: Plotting implicit space curves and surfaces.
2020	LearnVanishingIdeal.jl: Numerically derives Polynomials describing a point cloud.

Teaching

10/2023 – 02/2024	Seminar in Algorithmic Algebraic Geometry
04/2022 – 09/2022	Lecturer in Mathematisches Problemlösen
02/2020	Tutor of Computeralgebra
04/2018 – 09/2018	Mentor of Linear Algebra for Computer Scientists
04/2016 – 09/2017	Tutor of Computer-oriented Mathematics II and Mathematics for Geoscientists I and II

Awards

2018	Prize of the Berlin Mathematical Association for outstanding achievements in the bachelor's degree
2013	Book Prize of the German Physical Association for extraordinary achievements in the Abitur.

Berlin, November 30, 2023

Matthias Himmelmann