Klara Mundilova

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Education

09/2019 – 02/2024	Doctor of Philosophy, Computer Science, MIT Thesis Title: "Gluing and Creasing Paper along Curves: Computational Methods for Analysis and Design" Supervisor: Erik Demaine GPA 5.0 / 5.0
09/2017 – 08/2019	PhD candidate, Technical Mathematics, TU Wien Supervisors: Helmut Pottmann and Christian Müller
11/2014 – 06/2017	Master of Science, Technical Mathematics, TU Wien Thesis Title: "Geometry and Interactive Design of Curved Creases" Supervisor: Helmut Pottmann Graduation with Distinction
10/2010 – 11/2014	Bachelor of Science, Technical Mathematics, TU Wien Thesis Title: "Lineare Weingarten Kanalflächen" Supervisor: Udo Hertrich-Jeromin

Work Experience

09/2024 – present	Postdoctoral scientist *Geometric Computing Laboratory, EPFL, Switzerland*
02/2024 – present	Freelance Geometry Consulting *Vienna, Austria* • Consultation on geometric problems, particularly related to folding.
06/2024 – 09/2024	Project Assistant (8h/week) *Institute for Structure and Design, University of Innsbruck, Austria* • Research assistant for project "Plates to Structures".
03/2024 – 06/2024	Programmer (20h/week) *Rechenraum, Vienna, Austria* • Work on geometric data processing algorithms in C++.
10/2020 – 04/2021	Lecturer and Project Assistant (8h/week) *Institute for Structure and Design, University of Innsbruck, Austria* • Co-supervised a seminar for graduate students for the design and fabrication of curved crease origami shapes. • Developed Rhino plug-ins for interactive design of shapes with curved creases.

| 10/2017 – 09/2019 | University and FWF Project Assistant (30h – 40h/week) |
| | *Institute of Discrete Mathematics and Geometry, TU Wien, Austria* |

- Developed mathematical approaches to describe curved crease origami shapes, such as the folded Vesica Piscis.
- Taught a geometry course for graduate architecture students in English and multiple undergraduate geometry recitations.

| 08/2015 – 02/2017 | Programmer (20h – 28.5h/week) |
| | *Rechenraum, Vienna, Austria* |

- Implemented geometric data processing algorithms in C# and C++.

| 08/2014 – 09/2017 | Teaching Assistant (12.5h – 15h/week) |
| | *Institute of Discrete Mathematics and Geometry, TU Wien, Austria* |

- Taught multiple introductory geometry recitations and assisted with the supervision of exams.

Teaching

Massachusetts Institute of Technology, USA

6.042	Mathematics for Computer Science	Teaching Assistant
	Spring 2021, Fall 2021, Fall 2022	
6.849	Geometric Folding Algorithms	Teaching Assistant
	Fall 2020	

University of Innsbruck, Austria

| 847383 | Structure and Geometry | Seminar |
| | Fall 2020 | |

TU Wien, Austria

104.361	Geometry Optimization and Discretization	Lecture
	Fall 2017	
104.404	Projective Geometry	Recitation
	Spring 2018	
104.361	Geometry Optimization and Discretization	Recitation
	Fall 2014, Fall 2015, Fall 2016	
113.077	Basic Course in Geometry for Architects	Recitation
	Fall 2014, Spring 2015, Fall 2015, Spring 2016, Spring 2017	
104.218	Preparatory Course in Descriptive Geometry	Recitation
	Fall 2015, Fall 2016	

Awards and Fellowships

2024	Swiss Government Excellence Scholarship
2023	David S. Y. (1962) and Harold Wong Fellowship
2022	American Association of University Women International Fellowship
2022	Graduate Women International Fay Weber Award
2019	Akamai MIT Presidential Graduate Fellowship
2018	Christiane Hörbiger Preis

Publications

[1] K. Mundilova, E. Demaine, R. Lang, and T. Tachi. "Analysis of Huffman's Hexagonal Column with Cusps," to be published in the proceedings of 8OSME conference, 2024.

[2] K. Mundilova and G. Nawratil. "Rigid-Ruling Folding Compatibility of Planar Creases," to be published in the proceedings of 8OSME conference, 2024.

[3] ✩ R. Foschi, R. Maleczek, K. Mundilova, S. Nishimoto, T. Tachi. "Slit-Folding: Actuating Curved Creases by Closing Tailored Openings," to be published in the proceedings of 8OSME conference, 2024.

[4] K. Sharifmoghaddam, K. Mundilova , G. Nawratil, T. Tachi. "Woven Rigidly Foldable T-hedral Tubes Along Translational Surfaces," to be published in the proceedings of 8OSME conference, 2024.

[5] ✩ L. Chung, E. Demaine, M. Demaine, J. Diomidova, J. Lynch, K. Mundilova, and H. Zhang. "Folding a Strip of Paper into Shapes with Specified Thickness," to be published in the proceedings of 8OSME conference, 2024.

[6] K. Mundilova. "Maclaurin Trisectrices as t-Affine Loci of the First Isogonic and Isodynamic Centers," accepted to ICGG, 2024.

[7] K. Mundilova, E. Demaine, R. Lang, and T. Tachi. "Curved-Crease Origami Spirals Constructed from Reflected Cones," Bridges Conference Proceedings, 2023.

[8] ✩ R. Kraft, R. Maleczek, K. Mundilova, and T. Tachi. "From Quad Filling to Wrinkled Surfaces," Advances in Architectural Geometry, 2023.

[9] ⋆ A. Parra Rubio, ⋆ K. Mundilova, D. Preiss, E. Demaine, and N. Gershenfeld. "Kirigami Corrugations: Strong, Modular, and Programmable Plate Lattices," Proceedings of the ASME, 2023.

[10] P. Zhang, J. Chiang, X. Fan, and K. Mundilova. "Local Decomposition of Hexahedral Singular Nodes into Singular Curves," Computer-Aided Design, vol. 158, 2023.

[11] ✩ T. Hull, A. Lubiw, K. Mundilova, C. Nara, J. Tkadlec, and R. Uehara. "Quasi-Twisting Convex Polyhedra," 34th Canadian Conference Computational Geometry (CCCG), 2022.

✩ Authors are listed in alphabetical order.

⋆ Joint first author.

[12] ⭑ E. Demaine, K. Mundilova, and T. Tachi. "Locally Flat and Rigidly Foldable Discretizations of Conic Crease Patterns with Reflecting Rule Lines," Proceedings of the International Conference on Geometry and Graphics (ICGG), 2022.

[13] K. Mundilova, E. Demaine, R. Foschi, R. Kraft, R. Maleczek, and T. Tachi. "Lotus: A Curved Folding Tool for Grasshopper," Proceedings of ACADIA Conference, 2021.

[14] ⭑ O. Aichholzer, H. Akitaya, K. Cheung, E. Demaine, M. Demaine, S. Fekete, L. Kleist, I. Kostitsyna, M. Löffler, Z. Masárová, K. Mundilova, and C. Schmidt. "Folding Polyominoes with Holes into a Cube," Computational Geometry: Theory and Applications, vol. 93, 2021.

[15] ⭑ R. Foschi, R. Kraft, R. Maleczek, K. Mundilova, and T. Tachi. "How to Use Parametric Curved Folding Design Methods – A Case Study and Comparison," Proceedings of IASS Annual Symposia, no. 23, 2020.

[16] ⭑ R. Maleczek, K. Mundilova, and T. Tachi. "Curved Crease Edge Rounding of Polyhedral Surfaces," Proceedings of the AAG Conference, 2020.

[17] ⭑ K. Czajkowski, E. Demaine, M. Demaine, K. Eppling, R. Kraft, K. Mundilova, and L. Smith. "Folding Small Polyominoes into a Unit Cube," 32nd Canadian Conference on Computational Geometry (CCCG), 2020.

[18] ⭑ E. Demaine, M. Demaine, and K. Mundilova. "Design of Circular-Arc Curved Creases of Constant Fold Angle," Proceedings of Bridges Conference, 2020.

[19] C. Jiang, K. Mundilova, F. Rist, J. Wallner, and H. Pottmann. "Curve-pleated Structures," ACM Transactions on Graphics (TOG), 38(6): 169:1-169:13, 2019.

[20] K. Mundilova. "On Mathematical Folding of Curved Crease Origami: Sliding Developables and Parametrizations of Folds into Cylinders and Cones," Computer-Aided Design, vol. 115, 2019.

[21] K. Mundilova. "Curved Crease Folds of Spherical Polyhedra with Regular Faces," Proceedings of Bridges Conference, 2019.

[22] ⭑ O. Aichholzer, H. Akitaya, K. Cheung, E. Demaine, M. Demaine, S. Fekete, L. Kleist, I. Kostitsyna, M. Löffler, Z. Masárová, K. Mundilova, C. Schmidt. "Folding Polyominoes with Holes into a Cube," 31st Canadian Conference on Computational Geometry (CCCG), 2019.

[23] K. Mundilova and T. Wills. "Folding the Vesica Piscis," Proceedings of Bridges Conference, 2018.

[24] U. Hertrich-Jeromin, K. Mundilova and E. Tjaden. "Channel Linear Weingarten Surfaces," Journal of Geometry and Symmetry in Physics, vol. 40, p. 25–33, 2015.

Theses:

[25] "Gluing and Creasing Paper along Curves: Computational Methods for Analysis and Design," PhD Thesis, MIT, 2023.

[26] "Geometry and Interactive Design of Curved Creases," Master Thesis, TU Wien, 2017.

[27] "Lineare Weingarten Kanalflächen," Bachelor Thesis, TU Wien, 2014.

Talks

- Art-Inspired Curved-Crease Origami Research, Invited speaker at the Workshop on Discrete Geometric Structures, TU Wien, Austria, September 2024.

- Art-Inspired Curved-Crease Origami Research, Symposium on Origami Bridging Art Science and Industry, University of Tokyo, Japan, August 2024.

- Maclaurin Trisectrices as t-Affine Loci of the First Isogonic and Isodynamic Centers, International Conference on Geometry and Graphics, Kitakyushu, Japan, August 2024.

- Art-Inspired Curved-Crease Origami Research, AdCORP meeting #15, University of Tokyo, Japan, July 2024.

- Rigid-Ruling Folding Compatibility of Planar Creases, 8OSME Conference, Melbourne, Australia, July 2024.

- Analysis of Huffman's Hexagonal Column with Cusps, 8OSME Conference, Melbourne, Australia, July 2024.

- Art-Inspired Curved-Crease Origami Research, Gathering 4 Gardner – Celebration of Mind, online, June 2024.

- Mathematical Explorations of Curved-Crease Origami, Special Semester on Rigidity and Flexibility, RICAM, Linz, May 2024.

- Art-Inspired Curved-Crease Origami Design, AMS Special Session on Serious Recreational Mathematics, Joint Mathematics Meeting 2024, San Francisco, USA, January 2024.

- Art-Inspired Curved-Crease Origami Design, Haystack Labs, Haystack Mountain School of Crafts, Maine, USA, August 2023.

- Locally Flat and Rigidly Foldable Discretizations of Conic Crease Patterns with Reflecting Rule Lines, OrigaMIT Convention, Boston, Massachusetts, November 2022.

- Locally Flat and Rigidly Foldable Discretizations of Conic Crease Patterns with Reflecting Rule Lines, International Conference on Geometry and Graphics, online, August 2022.

- Lotus: A curved folding tool for Grasshopper, ACADIA Conference, online, November 2021.

- Architecture & Mathematics: How we Collaborate, Invited panelist at the DigitalFUTURES Talk with T. Knight, E. Demaine, and R. Maleczek, moderated by D. Koschitz and R. Brackett III, online, December 2021.

- Curved Crease Edge Rounding of Polyhedral Surfaces, Advances in Architectural Geometry Conference 2020, online, April 2021.

- Design of Curved Creases with Lotus, FoldFest 2021, online, April 2021.

- Lotus: Grasshopper components for curved folding, Guest Lecture, Pratt Institute of Design, online, March 2021.

- Design of Circular-Arc Curved Creases of Constant Fold Angle, Bridges Conference, online, 2020.

- Spherical Polyhedra with Regular Faces, Bridges Conference, Linz, Austria, 2019.

- On Mathematical Paper Folding, Symposium on Solid and Physical Modelling, Vancouver, Canada, 2019.

- On Mathematical Paper Folding, Symposium of Origami and Deployable Mechanisms, Okinawa, Japan, 2019.

- Origami Research (presented with Erik Demaine), OrigaMIT Convention, Boston, Massachusetts, 2018.

- Curved Crease Paper Folding with Rigid Rulings, ESI Workshop on Rigidity and Flexibility of Geometric Structures, Vienna, 2018.

- Folding the Vesica Piscis, Bridges Conference, Stockholm, Sweden, 2018.

- Symmetric Folded D-Forms from a Cylinder and Two Cones, Conference on Curves and Surfaces, Arcachon, France, 2018.

- Geometry and Interactive Design of Curved Creases, Conference on Geometry, Pilsen, Czech Republic, 2017.

Extracurricular Activities

07/2013 – 06/2015	Elected Student Representative of Technical Mathematics, TU Wien
07/2013 – 10/2016	Substitute student member of the Curricular Commission of Technical Mathematics, TU Wien
01/2012 – 06/2016	Student member in the Council of the Faculty of Mathematics and Geoinformation, TU Wien