

# Mina Konaković Luković

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## Research Interests

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Computer Graphics, Computational Fabrication, Machine Learning, 3D Geometry Processing, Differential Geometry, Shape Modeling and Analysis, Robotics

## Education and Academic Positions

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- Sep 2019 - present **Massachusetts Institute of Technology, USA**  
Schmidt Science **Postdoctoral** Fellow  
Computer Science and Artificial Intelligence Laboratory  
The Computational Design and Fabrication Group  
Mentor: *Prof. Dr. Wojciech Matusik*
- Sep 2014 - Jul 2019 **Swiss Federal Institute of Technology Lausanne (EPFL), Switzerland**  
**PhD** in Computer Science  
Computer Graphics and Geometry Laboratory  
PhD thesis: *Computational Design of Auxetic Shells*  
Advisor: *Prof. Dr. Mark Pauly*
- Sep 2013 - Aug 2014 **Faculty of Mathematics, University of Belgrade, Serbia**  
**MSc** in Mathematics, module Computer Science and Informatics  
First Class Honor, GPA: **10.00/10.00**  
Master thesis: *Stochastic context free grammars and applications*  
Advisor: *Prof. Dr. Gordana Pavlović-Lažetić*
- Sep 2009 - Jul 2013 **Faculty of Mathematics, University of Belgrade, Serbia**  
**BSc** in Mathematics, module Computer Science and Informatics  
First Class Honor, GPA: **10.00/10.00**
- Sep 2005 - Jun 2009 **Mathematics High School, Belgrade, Serbia**  
Special track for gifted students  
GPA: 5.00/5.00

## Publications

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- **M. Konaković Luković**, Y. Tian, W. Matusik  
[Diversity-Guided Multi-Objective Bayesian Optimization With Batch Evaluations](#)  
*Advances in Neural Information Processing Systems (NeurIPS) 2020*
- A. Zhao, J. Xu, **M. Konaković-Luković**, J. Hughes, A. Spielberg, D. Rus, W. Matusik  
[RoboGrammar: Graph Grammar for Terrain-Optimized Robot Design](#)  
*ACM Transactions on Graphics (Proceedings of SIGGRAPH Asia) 2020*
- T. Erps, M. Foshey, **M. Konaković Luković**, W. Shou, H. Goetzke, H. Dietsch, K. Stoll, W. Matusik  
Accelerated Discovery of 3D Printing Materials Using Data-Driven Multi-Objective Optimization  
Under review for *Science Advances* (submitted November 2020)

- J. Panneta, **M. Konaković-Luković**, F. Isvoranu, E. Bouleau, M. Pauly  
[X-Shells: A new class of deployable beam structures](#)  
*ACM Transactions on Graphics (Proceedings of SIGGRAPH)* 2019
- **M. Konaković-Luković**  
[Computational Design of Auxetic Shells](#)  
*EPFL PhD Thesis* 2019
- **M. Konaković-Luković**, P. Konaković, M. Pauly  
[Computational Design of Deployable Auxetic Shells](#)  
*Advances in Architectural Geometry* 2018
- **M. Konaković-Luković**, J. Panneta, K. Crane, M. Pauly  
[Rapid Deployment of Curved Surfaces via Programmable Auxetics](#)  
*ACM Transactions on Graphics (Proceedings of SIGGRAPH)* 2018
- C. Robeller, **M. Konaković**, M. Dedijer, M. Pauly, Y. Weinand  
[Double-layered Timber Plate Shell](#)  
*International Journal of Space Structures* 2017
- C. Robeller, **M. Konaković**, M. Dedijer, M. Pauly, Y. Weinand  
[A Double-layered Timber Plate Shell - Computational Methods for Assembly, Prefabrication and Structural Design](#)  
*Advances in Architectural Geometry* 2016
- **M. Konaković**, K. Crane, B. Deng, S. Bouaziz, D. Piker, M. Pauly  
[Beyond Developable: Computational Design and Fabrication with Auxetic Materials](#)  
*ACM Transactions on Graphics (Proceedings of SIGGRAPH)* 2016

## Patents

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- **Systems and Methods for Formulating Material in a Data-Driven Manner.** M. Foshey, T. Erps, M. Konaković Luković, W. Matusik, W. Shou, K. Stoll, B. Ulrich, H. Goetzke. US Patent Application No. 17/061,548
- **Method of encoding a 3D shape into a 2D surface.** M. Konaković Luković, K. Crane, M. Pauly, J. Panetta. US Patent Application No. 16/186,901

## Selected Press Coverage

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- **WIRED:** [A Freaky Anti-Rubber Is Still Weirding Scientists Out](#)
- **The Weather Channel:** [Most Contrary Material on Planet?](#)
- **TechChurch:** [New technique lets you fold flat metal or plastic into a 3D shape](#)
- **Business Standard:** [New method to create everyday objects in a 3D shape](#)
- **Phys.org:** [Creating 3-D objects from inextensible sheet materials](#)
- **Design Engineering:** [New computational design tool turns flat sheets into complex 3D shapes](#)
- **EUREKA:** [Computational design tool transforms flat materials into 3D shapes](#)
- **3ders.org:** [New 3D design tool turns flat 2D sheets of metal or plastic into complex 3D shapes](#)
- **Space Daily:** [Computational design tool transforms flat materials into 3-D shapes](#)
- **Swissinfo.ch:** [Damenschuh im "Löcher-Look": Schlitze machen Blech beliebig formbar](#)
- **World Economic Forum:** [Designing a robot? AI can tell you which shape will work best](#)

## Honors and Awards

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- **Society for Industrial and Applied Mathematics (SIAM) Activity Group on Geometric Design Early Career Prize**  
Awarded every two years to an outstanding early career researcher in the field of geometric design and processing, for distinguished contributions to the field, influential applications of geometry in industry, and exceptional achievements regarding the popularization of geometric design to the general public
- **Schmidt Science Fellowship** (In partnership with the Rhodes Trust)  
For the postdoctoral studies in 2019/20, awarded to 20 researchers worldwide across all areas of science
- **Schmidt Science Fellowship Additional Study Grant** (In partnership with the Rhodes Trust)  
For the postdoctoral studies in 2020/21, awarded to exceptional cases of Schmidt Science Fellows
- **ACM SIGGRAPH Outstanding Doctoral Dissertation Honorable Mention**  
Awarded annually to theses in computer graphics and interactive techniques worldwide
- **Eurographics PhD Award**  
Awarded annually to outstanding theses in the field of computer graphics conducted in Europe
- **Patrick Denantes Memorial Prize for outstanding PhD thesis**  
Awarded to 1 dissertation per year in the School of Computer and Communication Sciences, EPFL
- **Doctoral Program Thesis Distinction**  
Awarded to best 8% theses per year of each doctoral program at EPFL
- **ACM Doctoral Dissertation Award Nominee**  
Awarded annually to thesis in computer science and engineering (2 nominations per institution allowed)
- **Rising Stars in EECS 2019 & 2020**  
Selected participant in the academic career workshop for women in electrical engineering and computer science
- **SIGGRAPH Doctoral Consortium 2018**  
Selected participant as 1 of 8 best graduating PhD students from the field of computer graphics
- **The Government of Serbia Fund for Young Talents scholarship**  
For the best students from Serbia studying abroad in 2015, 2016, 2017, 2018, 2019
- **EPFL EDIC Fellowship**  
For the first year of PhD studies in 2014/2015
- **Crown of Success award**  
For the best female student of the University of Belgrade, graduating in 2013
- **City of Belgrade scholarship**  
For the best students in the city of Belgrade in 2011, 2012, and 2013
- **Faculty of Mathematics excellence award**  
For outstanding academic performance and the best students in 2011, 2012, and 2013

## Research Experience

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- Sep 2019 - present      **Postdoctoral Researcher, The Computational Design and Fabrication Group, MIT, Cambridge, MA, USA**  
Mentor: *Prof. Dr. Wojciech Matusik*  
Developing machine learning algorithms for applications in robotics and 3D printing

- Jul 2018 - Oct 2018     **Research Intern, Adobe Research, Seattle, WA, USA**  
 Mentor: *Dr. Danny Kaufman*  
 Worked on a framework for Curved-Folding Origami
- Jun 2017 - Sep 2017     **Visiting Researcher, Carnegie Mellon University, PA, USA**  
 Host: *Prof. Dr. Keenan Crane*  
 Worked on topics in (Discrete) Differential Geometry
- Aug 2016 - Sep 2016     **Visiting Researcher, Carnegie Mellon University, PA, USA**  
 Host: *Prof. Dr. Keenan Crane*  
 Worked on topics in Conformal Geometry Processing
- Aug 2015 - Aug 2018     **PhD Researcher, Swiss National Centre of Competence in Research Digital Fabrication (NCCR dfab), ETH, Switzerland**  
 Project: Geometric Optimization for Integral Mechanical Attachment for Timber Plate Structures (collaboration with structural engineers and architects)
- Feb 2015 - Aug 2019     **Research Assistant, Computer Graphics and Geometry Laboratory (LGG), EPFL, Switzerland**  
 Mentor: *Prof. Dr. Mark Pauly*  
 Project: Geometry Optimization for Digital Fabrication and Architectural Design

## Teaching Experience

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- Teaching
  - 6.807 Computational Design and Fabrication, MIT, USA**  
 Guest Lecturer in Fall **2020** (~ 20 students)  
 Prepared and presented a lecture on Bayesian Optimization for Computational Design
  - CS-341 Introduction to Computer Graphics, EPFL, Switzerland**  
 Head teaching assistant in Spring **2016, 2017, 2018** (~ 90-120 students)  
 Developed lectures and homework assignments for practical sessions; supervised projects; developed final exam; graded weekly written and coding homework, projects, and written exam
  - CS-446 Digital 3D Geometry Processing, EPFL, Switzerland**  
 Head teaching assistant in Fall **2016, 2017, 2018** (~ 30-50 students)  
 Developed lectures and homework assignments for practical sessions; supervised projects; developed final exam; graded weekly written and coding homework, projects, and written exam
  - MATH-111 Linear Algebra, EPFL, Switzerland**  
 Teaching Assistant in Fall **2015** (~ 350 students)  
 Held practical sessions
- Mentoring
  - Graduate students mentoring, MIT, USA**  
 2020 - present, Yunsheng Tian, *Multi-Objective Bayesian Optimization Framework*  
 2019 - present, Allan Zhao, *Graph Grammars for Optimal Robot Design*
  - Master students semester projects, EPFL, Switzerland**  
 2019, Didier Bieler, *Computational Design for Hierarchical Auxetics*  
 2018, Antoine Hoffmann, *Structure and Appearance Optimization for Controllable Shape Design*  
 2017, Gaspard Zoss, *Computational Smart Materials*  
 2017, Malcom Malo Drougard, *A New Way to Knit*  
 2016, Hao Sun, *Form Finding Optimization for Shading System*  
 2015, Vincent de Marignac, *Fabrication-Aware Design of Open-Tiling*

## Selected Talks and Workshops

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- **International seminar on Geometric Modeling, Geometry Processing, and Computational Geometry, December 2020, Technion, Haifa, Israel (Virtual)**  
Invited speaker
- **Graphics Talks, October 2019, MIT, Boston, USA**  
Invited speaker
- **Physics-based Modeling for Computational Fabrication and Robotics Course, May 2019, ETH, Zurich, Switzerland**  
Invited speaker
- **ACM SIGGRAPH, August 2018, Vancouver, Canada**  
Technical paper presenter
- **International Geometry Workshop, September 2017, Obergurgl, Austria**  
Invited participant
- **ACM Symposium on Computational Fabrication, June 2017, MIT, Boston, USA**  
Selected presenter
- **SIGCHI Summer School: Computational Fabrication and Smart Matter, June 2017 MIT, Boston, USA**  
Selected participant
- **ACM SIGGRAPH, July 2016, Anaheim, USA**  
Technical paper presenter

## Professional Services

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- Review Services      **ACM SIGGRAPH 2019, 2020** - technical papers  
                                 **ACM SIGGRAPH ASIA 2019, 2020** - technical papers  
                                 **ACM CHI 2020** - technical papers  
                                 **ACM Transactions on Graphics 2019** - technical papers  
                                 **Eurographics 2020** - technical papers
- Program committee      **Graphics Interface 2019, 2021** - technical papers  
                                 **Graphics Replicability Stamp Initiative 2020-2023** - evaluation committee

## Other Activities

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- Won several national and international awards in Dance Sport Competitions
- Won several national and international awards in Piano Competitions
- DanceSport trainer, Salsa and Argentine Tango instructor in 2010-2013
- Member of the Academic Choir Obilić (Krsmanac) in 2011-2014
- Hobbies: sewing, tennis, skiing, guitar playing, travelling, sailing, cooking