

PROMOTION RECOMMENDATION
The University of Michigan
College of Engineering
Department of Civil and Environmental Engineering

Evgueni Filipov, assistant professor of civil and environmental engineering Department of Civil and Environmental Engineering, and assistant professor of mechanical engineering, Department of Mechanical Engineering, College of Engineering, is recommended for promotion to associate professor of civil and environmental engineering, with tenure, Department of Civil and Environmental Engineering, and associate professor of mechanical engineering, without tenure, Department of Mechanical Engineering, College of Engineering.

Academic Degrees:

Ph.D.	2016	University of Illinois, Civil Engineering, Urbana-Champaign, IL
M.S.	2012	University of Illinois, Civil Engineering, Urbana-Champaign, IL
B.S.	2009	Rensselaer Polytechnic Institute, Civil and Environmental Engineering, Troy, NY

Professional Record:

2021 – Present	Assistant Professor, Department of Mechanical Engineering, University of Michigan
2017 – Present	Assistant Professor, Department of Civil and Environmental Engineering, University of Michigan

Summary of Evaluation:

Teaching: Professor Filipov has taught three distinct courses at the University of Michigan at the undergraduate and graduate level with uniformly strong course evaluations. His introduction of the new graduate course CEE 518 Deployable and Reconfigurable Structures is a welcome and notable addition to the college curriculum, and his revamped undergraduate course CEE 212 Solid and Structural Mechanics to a flipped format is laudable. Professor Filipov has an excellent reputation among students inside and outside of the classroom. Students consider him to be a well-organized, insightful, and engaging lecturer. He projects an approachable and helpful demeanor and is clearly committed to student success. Professor Filipov is an active and effective mentor, graduating four Ph.D. students (one co-chaired), with eight more in the pipeline, as well as advising two post-doctoral fellows, 11 M.S. students and 23 undergraduate researchers. He is also active in outreach activities in the college and local community. He treats students with respect and understanding while providing a high-quality learning experience.

Research: Professor Filipov's research focuses on the folding of thin origami sheets to construct deployable, adaptable, and multi- functional structural systems with tailorable shape, stiffness, and deformation characteristics. Engineering origami structures requires deep knowledge at the intersection of structural engineering and mechanics. His simulation techniques span multiple scales from high fidelity simulations that require high computational resources to reduced order models that capture the essence of structural response with minimal computational effort. His

ability to span computational scales is one of Professor Filipov's academic hallmarks. His work is not only computational, but also rigorously theoretical. His research reputation for creativity and excellence are high and his leadership in the fields of origami engineering and mechanics is internationally recognized and highly appreciated. The principles of origami engineering are inherently scalable making Professor Filipov's work broadly applicable to multiple scales and various disciplines, including structural, bio-medical and mechanical engineering, as well as architecture. In the pursuit of his research interests, Professor Filipov has collaborated with colleagues in various fields across the University of Michigan campus and internationally.

Professor Filipov has over 20 peer-reviewed articles in journals of high quality. A number of them appear on high-impact, cross-disciplinary journals such as *Proceedings of the National Academy of Science* and *Proceedings of the Royal Society* or top journals in his field. Professor Filipov has been successful in securing funding for his research from the NSF, DoD and industry to support his research program. He has been recognized with the prestigious NSF CAREER and DARPA YFA awards.

Recent and Significant Publications:

Zhu, Y., Schenk, M., and Filipov, E. T., "A Review on Origami Simulations: From Kinematics, To Mechanics, Toward Multiphysics ASME," *Appl. Mech. Rev.* May 2022; 74(3): 030801.

Redoutey M., Roy A., Filipov E.T. "Pop-up Kirigami for Stiff, Dome-like Structures," *International Journal of Solids and Structures.* 10/2021; 229: 111140.

Woodruff S.R., Filipov E.T. "Curved Creases Redistribute Global Bending Stiffness in Corrugations: Theory and Experimentation," *Meccanica.* 01/2021; 56(6): 1613-1634.

Zhu Y., Birla M., Oldham K.R., Filipov E.T. "Elastically and Plastically Foldable Electro-Thermal Micro-Origami for Controllable and Rapid Shape Morphing," *Advanced Functional Materials.* 07/2020; 30(40): 2003741.

Filipov E.T., Tachi T., Paulino G.H. "Deployable Sandwich Surfaces with High Out-of-Plane Stiffness," *ASCE Journal of Structural Engineering.* 02/2019; 145(2): 04018244.

Service: Professor Filipov has chosen his service activities to have the greatest impact on his profession and his students. As the current chair of the Elasticity Committee of the ASCE Engineering Mechanics Institute, Professor Filipov initiated a student paper competition and established a lecture series. He organized sessions at several conferences for both civil and mechanical engineering professional societies. Professor Filipov's internal service has been equally impactful. As a member of the CEE Graduate Committee, he identified and corrected issues that had existed in CEE's admissions, mentoring and examination processes. He has played a leading role in the Michigan Materials Research Institute; he organized workshops and developed a proposal to fund Additive Manufacturing in the College. As the faculty advisor for Chi Epsilon, the Civil Engineering Honor Society, he invigorated this critical student organization after several years of dormancy. He is committed to the principles of DEI, e.g. he introduced an 'engineer of the week' module in CEE 212 to highlight diversity in modern prominent engineers.

External Reviewers:

Reviewer A: “I believe this a clear-cut case of an extraordinarily talented and accomplished individual, a rising star that I expect will become a leader of his generation. I must say that of the dozens of promotion and tenure files I have seen and evaluated over the past three decades, I do not remember a stronger one than Prof. Filipov’s.”

Reviewer B: “Professor Filipov is the most promising [junior] academic I know of worldwide in the area of origami, and you are lucky to have him.”

Reviewer C: “He is a scholar that is making novel and deep academic contributions, and is involved in multi-disciplinary collaborations that will provide exciting applications for his work.”

Reviewer D: “He is certainly in the top of his field within his peer group, having one of the most successful outputs in terms of research funding and publication impact.”

Reviewer E: “Prof. Filipov and his team have reported highly impactful and creative work in origami mechanics in the past years, and he is one of the leading scholars in this blossoming field of origami engineering.”

Summary of Recommendation: Professor Filipov has had an extremely strong start at the University of Michigan. His students report that he is a highly enthusiastic instructor and mentor who is deeply committed to their learning and future success. His research productivity and reputation for quality and excellence are high and trending strongly upward. He has been active in highly impactful professional and university service. It is with the support of the College of Engineering Executive Committee that I recommend Evgueni Filipov for promotion to associate professor of civil and environmental engineering, with tenure, Department of Civil and Environmental Engineering, and associate professor of mechanical engineering, without tenure, Department of Mechanical Engineering, College of Engineering.



Alec D. Gallimore, Ph.D.
Robert J. Vlasic Dean of Engineering
College of Engineering

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