

PROMOTION RECOMMENDATION
The University of Michigan
College of Engineering
Department of Mechanical Engineering

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

Academic Degrees:

Ph.D.	2006	University of Bristol, Engineering Mathematics, Bristol, United Kingdom
M.S.	2002	Budapest University of Technology, Engineering Physics, Budapest, Hungary

Professional Record:

2018 – present	Associate Professor (without tenure), Department of Civil Environmental Engineering, University of Michigan
2017 – present	Associate Professor (with tenure), Department of Mechanical Engineering, University of Michigan
2010 – 2017	Assistant Professor, Department of Mechanical Engineering, University of Michigan
2008 – 2010	Post-Doctoral Fellow, Department of Mechanical Engineering, University of California, Santa Barbara, Santa Barbara, CA, United States of America
2005 – 2008	Post-Doctoral Fellow, Computing and Mathematics, University of Exeter, Exeter, United Kingdom

Summary of Evaluation:

Teaching: Professor Orosz enhanced the Mechanical Engineering program by creating two new graduate courses (ME 545 Dynamics and Control of Connected Vehicles, ME 548 Applied Nonlinear Dynamics), and revamping ME 542 Vehicle Dynamics and Automation. These additions were highly appreciated by students, with one former student, now employed at GM, praising the impactful learning experience. Professor Orosz has graduated eight Ph.D. students (two as co-chair) and has another six in progress (three expected to graduate in 2024). He is also a member of several other Ph.D. committees and has advised several master's and undergraduate students and mentored 15 visiting scholars and one post-doctoral scholar.

Research: Professor Orosz's scholarly output has been excellent, with a publication record that includes a book, several book chapters, and a total of 68 papers in archival journals, 46 of which have been published in the last six years. Notably, a significant portion of his recent papers have been co-authored with his research students. According to Google Scholar, his papers have received 5,500 citations, highlighting the impact of his research, as evidenced by his h-index of 34. Professor Orosz has been successful in attracting support from both industrial and federal sources, as a sole investigator and in collaboration with colleagues from the University of

Michigan. Currently, he has secured approximately \$1.7M in funding, with a total of \$2.6M awarded during his current rank.

Recent and Significant Publications:

- H. M. Wang, S. S. Avedisov, T. G. Molnár, A. H. Sakr, O. Altintas, G. Orosz, “Conflict analysis for cooperative maneuvering with status and intent sharing via V2X communication,” *IEEE Transactions on Intelligent Vehicles*, 8(2): 1105-1118, 2023.
- M. Shen, R. A. Dollar, T. G. Molnár, C. R. He, A. Vahidi, G. Orosz, “Energy-efficient reactive and predictive connected cruise control,” *IEEE Transactions on Intelligent Transportation Systems*, 2023.
- S. Beregi, S. S. Avedisov, C. R. He, D. Takács, G. Orosz, “Connectivity-based delay-tolerant control of automated vehicles: theory and experiments,” *IEEE Transactions on Intelligent Vehicles*, 8(1): 275-289, 2023.
- A. Alan, A. J. Taylor, C. R. He, A. D. Ames, G. Orosz, “Control barrier functions and input-to-state safety with application to automated vehicles,” *IEEE Transactions on Control System Technology*, 2023.
- Chen, M, Ding, X, Que, L, Liang, X, “Fabrication of microstructures on curved hydrogel Substrates,” *Journal of Vacuum Science and Technology B*, 40(5): 052804, 2022.

Service: Professor Orosz has made contributions to service both internally and externally. Within the department, he has actively participated in several departmental committees, notably the ME Graduate Program Committee and the ME Graduate Admissions Committee. Externally, his service is commendable, as evidenced by his roles as associate editor of two IEEE journals and his recent completion of a term as an associate editor of *Transportation Research Part C*. Additionally, he holds the position of vice chair at the International Federation for Automatic Control (IFAC) Technical Committee on Linear Systems. Since 2018, he has been an active member of the Organizing Committee for three meetings and has served as the chair or co-chair for two other meetings.

External Reviewers:

Reviewer A: “Based on my review of Prof. Orosz’s research and publications, I believe that he is a gifted scientist whose work has resulted in significant advancements in all scientific fields he has worked on.”

Reviewer B: “Review of the provided and other papers of Dr. Orosz show that he is a well-established, well-cited and well-known researcher who mainly does both theoretical and experimental work in the control and stability of dynamic systems.”

Reviewer C: “Over the years, Gabor has made multiple contributions to traffic dynamics and control. He started this line of work early in his research career and some of his early notable results were focused on the impact of the driver’s reaction time in traffic dynamics.”

Reviewer D: “The application area, or more precisely, a large cluster of application topics, in which Gabor has emerged as one of the leading experts comprises traffic, connected vehicles, human-autonomous vehicle systems, vehicle safety, energy efficiency in transportation, congestion, traffic stability, and related topics.”

Reviewer E: “The series of studies by Dr. Orosz captures the critical change in traffic control philosophy and leads to many new models and ideas with the potential to be implemented for ground traffic in the future. His NSF CAREER Award proven[sic] that he is undoubtedly among the best in his...group.”

Summary of Recommendation: Professor Orosz has demonstrated a commitment to enhancing the Mechanical Engineering curriculum. His research focus on the control of autonomous vehicles has garnered substantial funding and has made significant contributions to the field. It is with the support of the College of Engineering Executive Committee that I recommend Gabor Orosz for promotion to professor of mechanical engineering, with tenure, Department of Mechanical Engineering, and professor of civil environmental engineering, without tenure, Department of Civil Environmental Engineering, College of Engineering.



Steven L. Ceccio, Ph.D.

Interim Dean

Vincent T. and Gloria M. Gorguze Professor
of Engineering
College of Engineering

May 2024