PROMOTION RECOMMENDATION
The University of Michigan
College of Engineering
Department of Electrical Engineering and Computer Science

Edwin B. Olson, associate professor of electrical engineering and computer science, with tenure, Department of Electrical Engineering and Computer Science, College of Engineering, is recommended for promotion to professor of electrical engineering and computer science, with tenure, Department of Electrical Engineering and Computer Science, College of Engineering.

Academic Degrees:
Ph.D.   2008   Massachusetts Institute of Technology, Computer Science and Engineering, Cambridge, MA
M.S.   2001   Massachusetts Institute of Technology, Electrical Engineering and Computer Science, Cambridge, MA
B.S.   2000   Massachusetts Institute of Technology, Electrical Engineering and Computer Science, Cambridge, MA

Professional Record:
2017-present   Founder and CEO, May Mobility, Inc., Ann Arbor, MI
2016-2016   Co-Director of Autonomous Driving, Toyota Research Institute, Ann Arbor, MI
2014-present   Associate Professor (with tenure), Department of Electrical Engineering and Computer Science, University of Michigan
2014-2014   Morris Wellman Assistant Professor, Electrical Engineering and Computer Science, University of Michigan
2008-2014   Assistant Professor, Department of Electrical Engineering and Computer Science, University of Michigan

Summary of Evaluation:
Teaching: Professor Olson teaches courses in Robotics, Artificial Intelligence, and Introductory Programming. He has developed several courses, most notably EECS 467, an undergraduate course in Autonomous Robotics. He has also innovated with a major experimental redesign of a lower-division programming course. Students commented on his dedication and commitment to classroom teaching. Professor Olson has guided eight Ph.D. students to completion (one as co-chair). His graduate mentees describe an effective and passionate research advisor. Professor Olson is also active in advising M.S. and undergraduate students and post-doctoral scholars.

Research: Professor Olson's research program centers around the problems encountered by collaborative systems of autonomous robots, with a strong emphasis on real-world systems building. There are several key thrusts to this work: localization using ultra-wideband radios, a visual information support system called April Tags, and collaborative but autonomous coordination strategies. The best-known and most impactful of these is April Tags, a system first described in 2011 and continuously updated and improved thereafter. April Tags are a 2D visual encoding of 3D position, orientation, and an identifier for tagged objects. This system is in wide use across the robotics research community, allowing others to make progress in planning and

acting without having to wait for visual sensing to catch up. Professor Olson has also had substantial impact in translating research to practice, first in the Ford-UM consortium, then in the Toyota Research Institute, and finally in May Mobility which he founded in 2017. This real-world experience has in turn informed Professor Olson's emerging research directions, seeking to reduce robot complexity, increase reliability, and better understand prediction confidence. Professor Olson has a substantial record of publishing in top journals and conferences in the Robotics field, and his work is well known and cited (h-index of 32 according to Google Scholar). He has also had excellent success raising funds to support his program, with sponsored research exceeding $11M (his share).

Recent and Significant Publications:
R. J. Marcotte, X. Wang, D. Mehta, E. Olson, "Optimizing Multi-Robot Communication Under Bandwidth Constraints," *Autonomous Robots*, 2019.
D. Mehta, G. Ferrer, E. Olson, "Autonomous Navigation in Dynamic Social Environments Using Multi-Policy Decision Making," *Proceedings of the IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 1190-1197, 2016.
E. Olson, "M3RSM: Many-to-Many Multi-Resolution Scan Matching," *Proceedings of the IEEE International Conference on Robotics and Automation (ICRA)*, 5815-5821, 2015.
M. Krogius, A. Haggenmiller, E. Olson, "Flexible Layouts for Fiducial Tags," *Proceedings of the IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2019.
E. Galceran, A. G. Cunningham, R. M. Eustice, E. Olson, "Multipolicy Decision-Making for Autonomous Driving via Changepoint-based Behavior Prediction," *Proceedings of Robotics: Science and Systems (RSS)*, 1367-1382, 2015.

Service: Professor Olson has been a dedicated citizen of the university and of his broader scholarly community. As a member of the CSE Admissions Committee, Professor Olson built a web-based tool for tracking and evaluating applicants. This tool was subsequently used for faculty recruiting. He was an early member of the Steering Committee for the Robotics Institute, and an internal reviewer noted a particularly impactful design contribution to the Ford Robotics building. He continues to serve as a reviewer for the main venues in his scholarly community. He has participated in the NSF ARTSI program, designed to broaden participation in computing via outreach to historically black colleges and universities.

External Reviewers:
Reviewer A: "…I believe Ed Olson to be a pioneering leader in the field of robotics with contributions meriting promotion to Professor."

Reviewer B: "…Ed has a knack for taking his robots to the next level by reframing problems in unexpected ways, and then creating new approaches to solve those problems that have strong principled foundations."

Reviewer C: "Edwin is an internationally leading researcher in autonomous robotics, and his work is widely known and respected."

Reviewer D: "Edwin (Ed) is a well-known researcher in autonomous robotic systems and has had an especially large impact in transitioning his system-building style of robotics research in to

the real world, and has helped put the University of Michigan on the map (again) as one of the nation's premier institutes for Robotics Research."

Reviewer E: "…Ed's overall record is favorably comparable with many already full professor colleagues at top universities around the world."

Reviewer F: "In my opinion, Ed stands at the top 1% of his peers, or higher."

Summary of Recommendation: Professor Olson is an established leader in real-world robotics problems. It is with the support of the College of Engineering Executive Committee that I recommend Edwin B. Olson for promotion to professor of electrical engineering and computer science, with tenure, Department of Electrical Engineering and Computer Science, College of Engineering.

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

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