Approved by the Regents May 15, 2014

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

Jeffrey T. Scruggs, assistant professor of civil and environmental engineering, Department of Civil and Environmental Engineering, College of Engineering, is recommended for promotion to associate professor of civil and environmental engineering, with tenure, Department of Civil and Environmental Engineering, College of Engineering.

Academic Degrees:

Ph.D.	2004	California Institute of Technology, Applied Mechanics, Pasadena, CA
M.S.	2000	California Institute of Technology, Applied Mechanics, Pasadena, CA
M.S.	1999	Virginia Polytechnic Institute and State University, Electrical Engineering, Blacksburg, VA
B.S.	1997	Virginia Polytechnic Institute and State University, Electrical Engineering, Blacksburg, VA

Professional Record:

2011-present	Assistant Professor, Department of Civil and Environmental Engineering, University of Michigan
2007-2011	Assistant Professor, Department of Civil and Environmental Engineering, Duke University, Durham, NC
2006	Research Engineer, Dynamic Systems Research, San Diego, CA
2005-2006	Visiting Researcher, University of California, San Diego, CA
2004-2005	GW Housner Post-doctoral Research Fellow, California Institute of Technology, Pasadena, CA

Summary of Evaluation:

Teaching: Professor Scruggs has amassed a solid teaching record, having taught cutting-edge graduate courses and fundamental undergraduate courses. His teaching scores are representative of his effectiveness as an educator. In graduate courses his average Q1 and Q2 scores are 4.6 and 4.8, respectively. In undergraduate courses his average Q1 and Q2 scores are 3.8 and 4.0, respectively. A special characteristic of Professor Scruggs' approach to education is his commitment to challenging students while providing them with an unusually high level of out-of-the-classroom support to ensure students attain their full potential. Outside of the classroom, Professor Scruggs has made noteworthy contributions to our graduate program by co-founding a new M.S. degree program in Infrastructure Systems, which represents one of the central pillars for the future of the Civil and Environmental Engineering profession. Professor Scruggs is a caring mentor of students conducting research under his direction. In addition to providing his Ph.D. advisees with every opportunity to excel in their education, he also exhibits a passion for engaging undergraduate students in research projects. He has graduated one Ph.D. student with another three in progress. The undergraduate students he has enlisted in his research have all gone on to pursue graduate degrees at the top-ten graduate programs in the field (including Michigan).

Research: Professor Scruggs is an internationally recognized leader of the field of mechatronics applied to dynamic infrastructure systems. He has made notable contributions to this field through the introduction of regenerative actuation technology and the advancement of offshore energy harvesting.

Professor Scruggs' success as a leading multidisciplinary authority on this topic is due to his versatility to conduct both rigorous theoretical work while performing full-scale validation experimentation in the field. Evidence of the prominence that Professor Scruggs has attained is his selection to receive a 2008 National Science Foundation CAREER Award, his invitation to join the 2008 National Academy of Engineering (NAE) Frontiers in Engineering (FOE) Symposium, and the selection of his work to receive best paper awards at leading conferences in the field. Professor Scruggs is a highly productive scholar. He has over 20 journal papers in an impressive array of venues including one article in *Science*. In addition, he has amassed a healthy level of funding totaling $2.1 million with $1.1 million dedicated exclusively to his research program.

Recent and Significant Publications:

J. T. Scruggs, S. M. Lattanzio, A. A. Taflanidis and I. L. Cassidy, "Optimal causal control of an ocean wave energy converter in a random sea," *Applied Ocean Research*, 42 (August), 1-15 (2013).
I. L. Cassidy and J. T. Scruggs, "Nonlinear stochastic controllers for power-flow constrained vibratory energy harvesters," *Journal of Sound and Vibration*, 332, 3134-3147 (2013).
I. L. Cassidy and J. T. Scruggs, "Statistically linearized optimal control of an electromagnetic vibratory energy harvester," *Smart Materials & Structures* 21, Article # 085003 (2012).
J. T. Scruggs and P. Jacob, "Harvesting Ocean Wave Energy," *Science* 323(1518), 1176-1178 (2009).
J. T. Scruggs, "An Optimal Stochastic Control Theory for Distributed Energy Harvesting Networks," *Journal of Sound and Vibration* 320(4-5), 707-725 (2009).
J. T. Scruggs and W. D. Iwan, "Structural Control with Regenerative Force Actuation Networks," *Journal of Structural Control & Health Monitoring*, 12(1), 25-46, (2005).

Service: Professor Scruggs has illustrated his leadership through an extensive record of service to the university and professional community. He has left an indelible mark on the international smart structure community by serving as the chair of the American Society of Civil Engineers (ASCE) Engineering Mechanics Institute Technical Committee on Structural Health Monitoring and Controls. He also serves on multiple other technical committees within ASCE and the American Society of Mechanical Engineers (ASME). Due to his stature as a leading authority in control theory and dynamical systems, Professor Scruggs was invited to serve as the ASCE society editor of the prestigious American Control Conference (ACC). On campus, Professor Scruggs has effectively served on various department committees and currently serves as the faculty advisor to the ASCE student chapter.

External Reviewers:
Reviewer A: "Dr. Scruggs's [sic] research accomplishments are exceptional for a researcher at this stage in his career. In a relatively short period of time Jeff has made a number of significant research contributions, published several pioneering articles, been active in professional societies, successfully obtained three federal grants, organized several conference sessions and advised a postdoc who has successfully obtained a prominent faculty position."

Reviewer B: "In the field of civil engineering there is no one of his high stature and achievement. The candidate's work is highly mathematical and rigorous, providing tools that can be applied to many areas."

Reviewer C: "In comparing Dr. Scruggs to others with strong applied mechanics/mathematics backgrounds, I would count him as one of the top early career scholars, not only in terms of productivity, but more importantly in the quality of his work."

Reviewer D: "He is undoubtedly among the very best in the emerging field of smart structures and systems…What separate[s] Dr. Scruggs' research from his peers is that his work is not only

mathematically rigorous and well founded in mechanics but also has practical implication to the design of electro-mechanical devices and renewable energy harvesters."

Reviewer E: "He has demonstrated that he can establish new research initiatives in areas in which he has few prior contacts, and follow these through to publishable conclusions."

Reviewer F: "The breadth of Dr. Scruggs' research is quite impressive. It is very difficult to make contributions of a theoretical nature and at the same time function as an experimentalist. There are not many researchers that have this capability, and this, I believe, makes Dr. Scruggs a valuable asset to your organization [sic]. In my opinion, Dr. Scruggs' research is of the highest quality."

Reviewer G: "Nationally, I would rank him amongst the top few in vibration control and energy harvesting at a similar stage of their career."

Reviewer H: "He is, quite notably, an NSF Career Award winner, which is well known to be one of the most competitive research awards for untenured faculty…and his very extensive professional service in organizing technical sessions at internationally-relevant conferences, reviewing for premier journals, and being asked to review external proposals."

Summary of Recommendation: Professor Scruggs is a prominent international leader within the Civil and Environmental Engineering profession, and one who has made significant intellectual contributions to the study of dynamical infrastructure systems and mechatronics. He is a role model educator who motivates and promotes the aspirations of his students. His service record is exemplary with Professor Scruggs playing key leadership roles in the international research community. It is with the support of the College of Engineering Executive Committee that I recommend Jeffrey T. Scruggs for promotion to associate professor of civil and environmental engineering, with tenure, Department of Civil and Environmental Engineering, College of Engineering.

David C. Munson Jr.

David C. Munson, Jr.
Robert J. Vlasic Dean of Engineering
College of Engineering

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