Approved by the Regents
May 20, 2021

PROMOTION RECOMMENDATION
The University of Michigan-Dearborn
College of Engineering and Computer Science

Shan Bao, associate professor of industrial and manufacturing systems engineering, without tenure, Department of Industrial and Manufacturing Systems Engineering, College of Engineering and Computer Science, is recommended for the granting of tenure to be held with his title of associate professor of industrial and manufacturing systems engineering, with tenure, Department of Industrial and Manufacturing Systems Engineering, College of Engineering and Computer Science.

Academic Degrees:

Ph.D.	2009	Industrial Engineering, The University of Iowa, Iowa City, IA, USA
M.S.	2003	Mechanical Engineering, Hefei University of Technology, Hefei, China
B.S.	2000	Mechanical Engineering, Hefei University of Technology, Hefei, China

Professional Record:

2018 – present	Associate Professor of Industrial and Manufacturing Systems Engineering, Department of Industrial and Manufacturing Systems Engineering University of Michigan-Dearborn, Dearborn, MI
2018 – present	Adjunct Associate Professor, Department of Civil and Environmental Engineering, University of Michigan, Ann Arbor, MI
2016 – present	Associate Research Scientist, Transportation Research Institute, University of Michigan, Ann Arbor, MI
2012 – 2016	Assistant Research Scientist, Transportation Research Institute, University of Michigan, Ann Arbor, MI
2009 – 2012	Post-doctoral Research Fellow, Transportation Research Institute, University of Michigan, Ann Arbor, MI

Summary of Evaluation:

Teaching: Professor Bao has taught IMSE 501, Human Factors and Ergonomics class since joining the department in the fall of 2018. IMSE 501 is a required course in the MSE in industrial and systems engineering and MS in human centered design and engineering programs. Professor Bao is also advising two students in their Ph.D. research and one student in his Doctor of Engineering research. She also advised and/or is advising thirteen students in their undergraduate research projects. The student evaluation scores of her teaching on "Q9: Overall, this was an excellent course," "Q20: How would you grade the instructor?" and "Q1: Considering the course syllabus and my goals, the course met my expectations" have been excellent, averaging 4.32, 4.48 and 4.28, respectively. Students consider Professor Bao to be an effective and knowledgeable instructor who is always prepared for class. Students had many positive comments about her concern for their learning and for her willingness to help.

Research: Professor Bao's research interests are in transportation safety, human factors, automated and connected vehicle technology, driver destruction, and naturalistic driving data analysis. She published 35 peer-reviewed papers in highly respected scholarly journals. Eleven of these papers were published or have been accepted for publication since she joined the Department of Industrial and Manufacturing Systems Engineering in 2018. She has an excellent record of acquiring funding for her research from a variety of sponsors, including federal agencies and industrial organizations. Since 2018, she secured research funding of almost $650K as the principal and co-principal

investigator. Professor Bao has presented her research at numerous international conferences, and was a keynote speaker for a few of them.

Recent and Significant Publications:

Bao, S., Wu, L., Yu, B., Sayer, J. R. An Examination of Teen Drivers' Car-following Behavior When Compared to Adult Drivers. *Accident Analysis Prevention*, (in press). Impact Factor: 3.655.

Hampshire, R. C., Bao, S., Lasecki, W., Daw, A., Pender, J. Air Traffic Control Principles Could Speed Driverless Cars' Deployment. *PLOS ONE*, 2020, 15 (5), e0232837. Impact Factor: 2.74.

Feng, S., Feng, Y., Sun, H., Bao, S., Zhang, Y., Liu, H. Testing Scenario Library Generation for Connected and Automated Vehicle Evaluation. *IEEE Transactions on Intelligent Transportation Systems*, 2020, doi: 10.1109/TITS.2020.2988309. Impact Factor: 6.319.

Yu, B., Bao, B., Feng, F., Sayer, J. R. Examination and Prediction of Drivers' Reaction When Provided With V2I Communication-Based Intersection Maneuver Strategies. *Transportation Research Part C: Emerging Technologies*, 2019, 106, pp. 17-28. Impact Factor: 6.077.

Yu, B., Bao, B., Chen, Y. Quantifying Visual Road Environment to Establish a Speeding Prediction Model: An Examination Using Naturalistic Driving Data. *Accident Analysis & Prevention*, 2019, 129, pp. 289-298. Impact Factor: 3.655.

Feng, F., Bao, S., Hampshire, R. C., Delp, M. Drivers Overtaking Bicyclists—An Examination Using Naturalistic Driving Data. *Accident Analysis & Prevention*, 2018, 115, pp. 98-109. Impact Factor: 3.655.

Li, Z., Bao, S., Kolmanovsky, I. V., Yin, X. Visual Distraction Detection Using Driving Performance Indicators with Naturalistic Driving Data. *IEEE Transactions on Intelligent Transportation Systems*, 2017, 99, pp. 1-8. Impact Factor: 6.319.

Service: Professor Bao, at the department level, serves on the Ph.D. ISE program committee and the Ph.D. ISE Qualifying Examination committee. At the college level, she is serving on four different committees, including the Journal/Conference Ranking committee and Simulation Selection and Acquisition committee. She is also a member of the Dearborn Artificial Intelligence Research Center. At the university level, she served on five different committees, including on the Faculty Research committee. Professor Bao has made excellent service contributions to her professional society. She was the chair of the Surface Transportation Technical Group of the Human Factors and Ergonomics Society. She is currently a program chair of the Human Factors Committee in the 2021 Transportation Research Board Annual Meeting, a member of the Transportation Research Board's Human Factors in Automated Vehicle Technologies sub-committee, and a member of the Transportation Research Board's Human Factors of In-Vehicle Systems committee.

External Reviewers:

Reviewer A: "Dr. Bao is one of the early researchers in this research area. Based on her publications, funding support, and agency and industry collaborations, I consider her one of the best scholars in the world in this emerging domain… The steady, diverse and healthy funding support from agencies and industry partners are truly remarkable, which clearly demonstrates her vision for identifying promising research directions and the ability to conduct high-quality research."

Reviewer B: "Her application of different analysis techniques to naturalistic driving data is particularly novel in our field and leads the way for enhanced knowledge extraction from this type of data."

Reviewer C: "Dr. Bao's work employs analytical models and development of novel metrics to quantify driver acceptance, trust, and interaction with automated vehicles. This is an important research area to ensure human factors considerations are fully given in the design of next generation transportation technology to which Dr. Bao's work has made significant contributions."

Reviewer D: "Dr. Bao has continued to make contributions to our understanding human behavior using naturalistic driving studies (studies done on the road in a driver's own vehicle), studies that are rigorous, impactful, and focused on problems central to the safety of the motoring public… Her ability to identify current areas of research that need exploring and, more importantly, her ability to bring a level of skill that few in human factors have to solutions to problems in these areas, is rare and not easily duplicated."

Reviewer E: "Her scholarly products are outstanding, compared to her peer group. Also, her research funding record is even more exceptional and not comparable to her peers… I believe that Dr. Bao is a highly productive professional with a national and budding international reputation, who has helped to shape our interdisciplinary field and promote our understanding of human factors in transportation and designing of better in-vehicle technologies. She is an exemplary researcher in our community. Even though her contributions to date are very impressive and exciting, I believe that her best work is still in the future."

Summary of Recommendation:
Professor Bao has established an excellent record of teaching, research, and service at the University of Michigan-Dearborn. We are pleased to recommend, with support of the College of Engineering and Computer Science Executive Committee, Shan Bao for promotion to associate professor of industrial and manufacturing systems engineering, with tenure, Department of Industrial and Manufacturing Systems Engineering, College of Engineering and Computer Science.

Ghassan Kridli, Interim Dean
College of Engineering and Computer Science

Domenico Grasso, Chancellor
University of Michigan-Dearborn

May 2021