Approved by the Regents
May 16, 2024

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

Shan Bao, associate professor of industrial and manufacturing systems engineering, with tenure, Department of Industrial and Manufacturing Systems Engineering, College of Engineering and Computer Science, is recommended for promotion to 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, University of Iowa, Iowa City, IA
M.S.	2003	Mechanical Engineering, Hefei University of Technology, Hefei, China
B.S.	2000	Mechanical Engineering, Hefei University of Technology, Hefei, China

Professional Record:

2022-present	Research Associate Professor, University of Michigan Transportation Research Institute, Ann Arbor, MI
2018-present	Associate Professor, University of Michigan-Dearborn, Dearborn, MI
2018-present	Adjunct Associate Professor, University of Michigan, Ann Arbor, MI
2016-2022	Associate Research Scientist, University of Michigan Transportation Research Institute, Ann Arbor, MI
2012-2016	Assistant Research Scientist, University of Michigan Transportation Research Institute, Ann Arbor, MI
2009-2012	Post-doctoral Research Fellow, University of Michigan Transportation Research Institute, Ann Arbor, MI

Summary of Evaluation:

Teaching: Professor Bao is rated significantly capable in teaching. Professor Bao has taught an industrial and manufacturing systems engineering (IMSE) course, IMSE 501: Human Factors and Ergonomics, since joining the department in the fall of 2018. IMSE 501 is a required course in the Master of Science in engineering (MSE) in industrial and systems engineering and the Master of Science (MS) in human-centered design and engineering programs. Professor Bao is advising and/or co-advising eight students in their Ph.D. research and one student in his Doctor of Engineering Research. She also advised sixteen students in their undergraduate research projects. 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 student learning and her willingness to help.

Research: Professor Bao is rated excellent in 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 53 peer-reviewed papers in highly respected scholarly journals. Out of those 53, 29 of these papers were published or have been accepted for publication since she joined IMSE in 2018. Professor Bao has an excellent record of acquiring funding for her research from a variety of sponsors, including federal agencies and industrial

sponsors. As the principal or sole principal investigator, since 2018, she secured research funding of $1,693,666. Professor Bao has presented her research at many international conferences and was a keynote speaker for a few of them. Professor Bao is the recipient of the 2023 UM-Dearborn Distinguished Research Award.

Recent and Significant Publications:

Dania Ammar, Yi Wu, Huizhong Gou, Aditi Misra, Bochen Jia, and Shan Bao (in press). "Identifying User Needs and Current Challenges of Interface Design for AV-VRU Communications: Insights from An Expert Survey Data Analysis." *Transportation Research Record*, impact factor: 1.90, h-index:141.

Li He, Bo Yu, Yuren Chen, Shan Bao, Kun Gao, You Kong (2023). "An interpretable prediction model of illegal running into the opposite lane on curve sections of two-lane rural roads from drivers' visual perceptions." *Accident Analysis & Prevention*, *186, 107066*, impact factor: 6.376, h-index:177.

Dania Ammar, Meitang Li, Bo Yu, Brian Lin, Arpan Kusari, Elizabeth Pulver, and Shan Bao (2023). "Driving Style Classification and ADAS Effectiveness: Differences between Teen and Adult Drivers." *Transportation Research Record*, *03611981231169525*, impact factor: 1.90, h-index:141.

Zhenxi Wu, Aditi Misra, Shan Bao (2023). "Modeling Pedestrian Injury Severity: A Case Study of Using Extreme Gradient Boosting Vs Random Forest in Feature Selection." *Transportation Research Record, 03611981231170014*, impact factor: 1.90, h-index:141.

Dania Ammar, Aditi Misra, Fred Feng, Shan Bao (2023). "Identify Factors related to Crash Injury Levels involving Bicyclists at different locations: A Crash Data Analysis." *Transportation Research Record*, *03611981221148486*, impact factor: 1.90, h-index:141.

Anuj K Pradhan, Ganesh Pai, Heejin Jeong, Shan Bao (2022). "Simulator evaluation of an intersection maneuver assist system with connected and automated vehicle technologies." *Ergonomics*, 1-16. impact factor: 2.95, h-index:124.

Bo Yu, Shan Bao, Yuren Chen, Dave LeBlanc (2021). "Effects of an Integrated Collision Warning System on Risk Compensation Behavior: An Examination under Naturalistic Driving Conditions." *Accident Analysis & Prevention*, *163, 106450*. impact factor: 6.376, h-index:177.

Service: Professor Bao is rated excellent in service. Professor Bao served on nine departmental committees, including the Ph.D. in industrial and systems engineering Qualifying Examination Committee. At the college level, she has served on twelve 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 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 was 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 Subcommittee, and a member of the Transportation Research Board's Human Factors of In-Vehicle Systems Committee. Professor Bao organized and chaired conference sessions and served as a reviewer for top-tier journals in her field.

External Reviewers:
Reviewer A: "Her research works on applying human factor analysis to the safety, sustainability, and accessibility of CAVs and EV charging are novel and ground-breaking… She has already established herself as one of the leading scholars worldwide in applying human factor methods to this critical area."

Reviewer B: "Her application of different analysis techniques to naturalistic driving data has been particularly novel in our field and leads the way for enhanced knowledge extraction from this type of data. Her evolving research focus to further study vulnerable road users, equity issues in transportation, and electric vehicles is also very timely and is poised to address important societal needs."

Reviewer C: "The quality and focus of Professor Bao's work are outstanding. She uses a combination of simulator-based and naturalistic driving datasets to examine driver behaviors and pedestrian safety… I was impressed with the thoroughness of the analysis and the techniques she used to analyze data to derive well-grounded insights into driver and pedestrian behavior… Professor Bao has developed a body of work across her career that has made significant contributions to her field."

Reviewer D: "In addition to her scientific production, Professor Bao is also author of several technical reports, has served as PI or co-PI in several projects, and has been very active in the human factors research community as reviewer and as organizer of several events."

Reviewer E: "Professor Bao's scholarly activities place her in the top tier among her peers. In addition to her impressive publication record, I am equally impressed by the quality and quantity of her grants ... Professor Bao developed a novel approach to measure and predict driver trust in autonomous vehicles, showcasing her profound understanding of driver behavior, automated driving systems, and advanced analytics. Her ability to innovate methods to address key transportation issues is evident."

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

Ghassan Kridli, Dean
College of Engineering and Computer Science

Domenico Grasso, Chancellor
University of Michigan-Dearborn

May 2024