

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

Abdallah Chehade, assistant professor of industrial and manufacturing systems engineering, Department of Industrial and Manufacturing Systems Engineering, College of Engineering and Computer Science, is recommended 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.

Academic Degrees:

Ph.D.	2017	Industrial Engineering, University of Wisconsin-Madison, Madison, WI
M.S.	2014	Industrial Engineering, University of Wisconsin-Madison, Madison, WI
M.S.	2014	Mechanical Engineering, University of Wisconsin-Madison, Madison, WI,
B.S.	2011	Mechanical Engineering, American University of Beirut, Beirut, Lebanon

Professional Record:

2017-present	Assistant Professor, Industrial and Manufacturing Systems Engineering, University of Michigan-Dearborn
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Summary of Evaluation:

Teaching: Professor Chehade is an excellent teacher. Since his appointment as an assistant professor in 2017, he taught bachelor's-, master's-, and doctoral-level courses in industrial and systems engineering and manufacturing engineering programs. At the undergraduate level, he taught Engineering Probability and Statistics, and Six Sigma and Statistical Process Control courses. At the master's level, he taught Probability and Statistical Models. At the Ph.D. level, he taught Multivariate Statistics.

Professor Chehade helped to introduce a new core course, Applied Statistical Models in Engineering, into the Bachelor of Science in Engineering in industrial and systems engineering, and Bachelor of Science in Engineering in manufacturing engineering programs. His overall instructor evaluations have been excellent averaging 4.36/5.0. Students consider Professor Chehade to be an excellent and knowledgeable instructor who is always prepared for the class. He advised and/or is advising seven students in their Ph.D. research and is co-advising one student in the Ph.D. Industrial Systems Engineering (ISE) program and one student in the Doctor of Engineering Automotive Systems and Mobility program.

Research: Professor Chehade is an impactful and promising researcher. His research primarily focuses on the development of data-driven approaches and machine-learning algorithms for system reliability analysis and advanced material discovery. Since joining the Industrial and Manufacturing Systems Engineering (IMSE) department in 2017, Professor Chehade has published 16 peer-reviewed papers in highly respected scholarly journals. Furthermore, he has been very successful in attracting external support for his research. He secured nine externally funded grants and contracts while at UM-Dearborn for a total of more than \$1.08 million.

Recent and Significant Publications:

Mayuresh Savargaonkar, Abdallah Chehade, Ala Hussein. “A Novel Neural Network with Gaussian Process Feedback for Modeling the State-of-Charge of Battery Cells.” *IEEE Transactions on Industry Applications*, Apr. 2022.

Zunya Shi, Abdallah Chehade. “A Dual-LSTM Framework Combining Change Point Detection and Remaining Useful Life Prediction.” *Reliability Engineering and System Safety*, Jan. 2021.

Abdallah Chehade, Zunya Shi. “Sensor Fusion via Statistical Hypothesis Testing for Prognosis and Degradation Analysis.” *IEEE Transactions on Automation Science and Engineering*, 16(4), pp. 1774–1787, Oct. 2019.

Abdallah Chehade, Changyue Song, Kaibo Liu, Abhinav Saxena, Xi Zhang. “A data-level fusion approach for degradation modeling and prognostic analysis under multiple failure modes.” *Journal of Quality Technology*, 50(2), pp. 150–165, Apr. 2018.

Service: Overall Professor Chehade’s performance was rated as significantly capable in this category. At the department level, he served on two faculty search committees and two lecturer major review committees. He is the faculty advisor for the Institute of Industrial Systems Engineering (IISE) student chapter at UM-Dearborn. The Chapter was recognized with the IISE Gold Award in 2022. At the college level, he serves on the graduate review committee for the Master of Science in data science program. Professor Chehade is also active in professional organizations. He has been a council member for the Quality, Statistics, and Reliability (QSR) section at the Institute for Operations Research and the Management Sciences (INFORMS) since 2020, chaired subcommittees and QSR workshops at INFORMS, and served on a National Science Foundation review panel. He also serves as a reviewer for top-tier journals in his field.

External Reviewers:

Reviewer A: “Dr. Chehade is a very productive researcher in his field and is very well recognized by his peers. He has demonstrated superb publication, educational and service records. I recommend that Dr. Chehade be granted Associate Professor status with Tenure. Your institution will be stronger as his career will continue to flourish.”

Reviewer B: “Dr. Chehade has developed novel approaches to combine information from multiple sensors of different types. One of the ideas is to combine the sensory information concisely into easy-to-understand health indices that contain most essential information about the degradation states of a unit. Such an idea greatly improves the practical applicability of the developed techniques. The practical relevance of Dr. Chehade’s research helped him secure a number of research grants from industries such as Ford and Honda R&D.”

Reviewer C: “He has shown an outstanding ability to develop new statistics and machine learning methods to solve real-world engineering problems. He has an excellent publication record for a junior faculty member. Thus, I believe the case for tenure and promotions to the rank of Associate Professor at UM-Dearborn is strong, and I give him my highest recommendation.”

Reviewer D: “The most prominent component of his scholarship lies in applying sophisticated statistical and machine learning approaches to solving challenging problems, with theoretical

explanations as well as consistent transferable knowledge. His efforts are of significant practical relevance and belong to the emerging area of Systems Informatics within the IMSE field. In all his research, Dr. Chehade takes a more rigorous and deeper approach, compared to what his peer group takes, addresses the underlying theoretical challenges, and considers the implementation complexity.”

Reviewer E: “Dr. Chehade and team are focused on finding the right balance between model accuracy versus explain-ability. Using the internet of things for big data collection, machine Learning (ML) and [Artificial Intelligence (AI)] models are being explored for real-time condition monitoring, degradation analysis, and prognostics at no or minimal cost of accuracy and precision. Explainable AI ultimately allows users to optimize resources, and it fosters collaboration between experts and external users.”

Reviewer F: “The level of industry collaboration and industry funding that Dr. Chehade has is outstanding. Dr. Chehade’s level of collaboration with industry, in my opinion, is a unique strength that Dr. Chehade brings to his peers in this field of study. Unlike others [sic] Dr. Chehade’s field, this industry collaboration makes it possible for his research developments and contributions to have a broader impact via implementation in industry processes and systems. Based on Dr. Chehade’s repeated industry funding, I expect this to continue.”

Reviewer G: “I truly believe that he is an outstanding researcher who has created special and indispensable research contributions given the complexity of this important problem and the diverse data structures that are encountered.”

Summary of Recommendation: Professor Chehade is a well-recognized and very productive scholar who has made significant contributions to the field of system reliability analysis and advanced material discovery. He is an excellent teacher and mentor; and he is a leader who contributes both in external and internal service. It is with the support of the College of Engineering and Computer Science Executive Committee that I recommend Abdallah Chehade 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, Dean
College of Engineering and Computer Science



Domenico Grasso, Chancellor
University of Michigan-Dearborn