PROMOTION RECOMMENDATION
The University of Michigan
College of Engineering
Department of Industrial and Operations Engineering

Raed Al Kontar, assistant professor of industrial and operations engineering, Department of Industrial and Operations Engineering, College of Engineering, is recommended for promotion to associate professor of industrial and operations engineering, with tenure, Department of Industrial and Operations Engineering, College of Engineering.

Academic Degrees:
Ph.D.   2018   University of Wisconsin-Madison, Industrial and Systems Engineering, Madison, WI
M.S.   2017   University of Wisconsin-Madison, Statistics, Madison, WI
B.S.   1998   American University of Beirut, Civil and Environmental Engineering, Beirut, Lebanon

Professional Record:
2018 – present   Assistant Professor, Department of Industrial and Operations Engineering, University of Michigan

Summary of Evaluation:
Teaching: Professor Al Kontar has built a strong teaching portfolio that spans undergraduate, master's, and doctoral levels. He offers mentoring to students in research at all levels, paying holistic attention to the academic success of both undergraduate and graduate students. Notably, his teaching and mentoring approaches are purposefully aligned with a focus on supporting underrepresented groups and embracing DEI principles. He has significantly modified and modernized STAT/IOE570 *Design of Experiments* and created a new course, IOE 691 *Modern Bayesian Data Science*. This new course introduces advanced Bayesian optimization methods with emerging applications in industrial engineering, which fits the department's needs and matches well with his research. He has also devoted his effort to integrating his teaching with research and outreach activities. Professor Al Kontar has advised or co-advised seven Ph.D. students. Two of his Ph.D. graduates currently hold tenure track assistant professor positions at peer institutions.

Research: Professor Al Kontar's research focuses on data-driven predictive analytics for the Internet of Things (IoT) enabled systems. He is recognized as a prolific researcher with significant scholarly contributions, particularly in his groundbreaking work in the emerging area of the Internet of Federated Things (IoFT). His research has brought a new perspective on data science into the industrial engineering discipline. He has established an impressive publication record, having authored over 25 peer-reviewed journal articles, most appearing in top-tier journals, and three papers in prestigious competitive conference proceedings. This substantial publication track record is further strengthened by 11 articles currently under review in reputable journals and conferences, demonstrating the quantity and quality of his exceptional scholarly contributions. He has received a total of $5.34 million in grants (his share is $1.7 million), funded by three NSF grants, including one NSF CAREER Award, and another two as a co-PI, one NIH grant as a co-PI, and several internal grants. External reviewers unanimously praised his innovative research and extraordinary achievements, placing him in the top class of his peer group. What sets him apart is his exceptional ability to identify and address challenging problems and strive for original contributions rather than

settling for incremental advancements. He and his students have received 15 awards or recognitions through various Best Paper competitions. Professor Al Kontar has developed a successful research program distinct from his earlier Ph.D. thesis work. He has also created a successful network of collaborators, both inside and outside IOE.

Recent and Significant Publications:
S. Chung, R. Al Kontar, "Federated Multi-output Gaussian Processes," *Technometrics*, 09/2023, accepted, in press.
N. Shi, R. Al Kontar, "Personalized Federated Learning via Domain Adaptation with an Application to Distributed 3D Printing," *Technometrics*, 65:3, 328-339.
X. Yue, M. Nouiehed, R. Al Kontar, "GIFAIR-FL: A Framework for Group and Individual Fairness in Federated Learning," *INFORMS Journal on Data Science*, 2(1):10-23.
H. Chen, L. Zheng, R. Al Kontar, G. Raskutti "Gaussian Process Parameter Estimation Using Mini-batch Stochastic Gradient Descent: Convergence Guarantees and Empirical Benefits," *Journal of Machine Learning Research (JMLR)*, 08/2022; 23: 1-59.
R. Al Kontar, S. Chung, N. Shi, X. Yu, E. Byon, M. Chowdhury, J. Jin, W. Kontar, N. Masoud, M. Nouiehed, C. Okwudire, G. Raskutti, R. Saigal, K. Singh, Z. Ye, "The Internet of Federated Things," *IEEE Access*, 11/2021; 9: 156071-156113.

Service: Professor Al Kontar has made substantial contributions to both internal and external services. His internal service includes several departmental committee memberships, including Graduate Admissions and Financial Aid (GAFA), the Ph.D. Recruiting and Placement Task-Force Committee, the Undergraduate Program Committee, the IOE Department Committee, and the DEI Committee. He served as a departmental seminar organizer and did an excellent job of inviting speakers and coordinating all associated activities. In addition, he has been engaged in internal service by serving as a faculty advisor for the Michigan Student Symposium for Interdisciplinary Statistical Sciences (MSSISS), a university-wide event run by five departments. Externally, he has taken a substantial editorial responsibility as an associate editor of *IEEE Transactions on Automation Science and Engineering* (*TAS*) and a reviewer for many premier journals in the field. In addition, he was elected to serve as a council member for the INFORMS Quality, Statistics, and Reliability Division, a substantial recognition of his contributions to the field. Professor Al Kontar has also been active in conference organization, being an invited session chair and organizer at numerous international conferences or workshops.

Professor Al Kontar is committed to fostering diversity, equity, and inclusion in all his academic activities. He has applied his research to improving public understanding of healthcare data and promoting equality in decision-making that accounts for disparities among populations. In teaching, he has embraced the principles of DEI to create an equal and inclusive learning environment for students of diverse backgrounds and by integrating education with research and outreach activities.

External Reviewers:
Reviewer A: "…Dr. [Al] Kontar has produced an impressive body of high-quality and impactful research that has appeared in top publication venues. His PhD student mentoring is very good and is supported by a strong funding program. He is an excellent academic citizen with outstanding service to the community and high visibility. His overall record is consistent with other high-caliber scholars who have recently been granted tenure at top universities. If he were going up for tenure at [my institution], he would have a very strong case."

Reviewer B: "Raed is one of the best and brightest researchers in our field…Should Raed's case be evaluated at [my institution], I am confident that he would pass the evaluation by a comfortable margin. I strongly support Raed's promotion to Associate Professor with tenure."

Reviewer C: "Dr. [Al] Kontar has made a significant contribution in this area, and I consider him one of the pioneers in the quality and reliability engineering research community who perform similar research…I strongly recommend Dr. [Al] Kontar's application for his promotion and tenure appointment at the Department of Industrial and Operations Engineering at the University of Michigan."

Reviewer D: "…Dr. Al Kontar has clearly established himself as one of the most impressive and foremost researchers in his peer group in data science in quality engineering. He has made important contributions to major areas, and his work has made an important impact on methodology with potential implementation in real applications. I strongly support him for the appointment as an associate professor with tenure."

Reviewer E: "…Dr. Al Kontar has established himself as a rising star in the field of data science and engineering...Dr. Al Kontar has demonstrated exceptional accomplishments in research, teaching, and service, making him highly deserving of promotion to Associate Professor with tenure."

Summary of Recommendation: Professor Al Kontar has developed an outstanding record of accomplishments in all major areas of scholarly activity. His research has developed innovative modeling approaches for using information from divergent sources with heterogeneity. Further, he is establishing himself as the leader in the field of Internet of Federated Things and personalized federated learning. It is with the support of the College of Engineering Executive Committee that I recommend Raed Al Kontar for promotion to associate professor of industrial and operations engineering with tenure, Department of Industrial and Operations Engineering, College of Engineering.

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Steven L. Ceccio, Ph.D.
Interim Dean of Engineering
Vincent T. and Gloria M. Gorguze Professor
of Engineering
College of Engineering

May 2024