Approved by the Regents
May 18, 2017

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

Eunshin Byon, assistant professor of industrial and operations engineering, Department of Industrial and Operations Engineering, and assistant professor of civil and environmental engineering, Department of Civil and Environmental Engineering, College of Engineering, is recommended for promotion to associate professor of industrial and operations engineering, with tenure, Department of Industrial and Operations Engineering, and associate professor of civil and environmental engineering, without tenure, Department of Civil and Environmental Engineering, College of Engineering.

Academic Degrees:

Ph.D.	2010	Texas A&M University, Industrial and Systems Engineering, College Station, TX
M.S.	1996	Korea Advanced Institute of Science and Technology, Industrial and Systems Engineering, Daejon, Korea
B.S.	1994	Korea Advanced Institute of Science and Technology, Industrial and Systems Engineering, Daejon, Korea

Professional Record:

2015-present	Assistant Professor, Department of Civil and Environmental Engineering, University of Michigan
2011-present	Assistant Professor, Department of Industrial and Operations Engineering, University of Michigan
2010-2011	Post-Doctoral Research Associate, Industrial and Systems Engineering Department, Texas A&M University, College Station, TX
1999-2005	Strategic Manager and Consultant, Consodata Korea, Seoul, Korea
1996-1999	IT Consultant, LG-EDS Systems, Seoul, Korea

Summary of Evaluation:
Teaching: Professor Byon has taught two courses over the last two years: IOE 366 (Linear Statistical Models) and IOE 565 (Time Series Modeling, Analysis and Forecasting), which is jointly listed with the Department of Mechanical Engineering. IOE 366 is a required undergraduate course with enrollments ranging from 100 to 128. As such, this is a particularly challenging course to teach. Her evaluations are very good, particularly her Q2 scores, which have averaged 4.5 over the last two offerings of this course. Enrollments in IOE 565 have ranged from 30 to 51. Again, her course evaluations are very strong. Her three most recent Q2 scores average 4.6. The letters from students attest to her strength in and dedication to teaching. She has graduated one Ph.D. student who is now a professor at the University of Washington and is working with four other Ph.D. students. She is also working with three master's students and four undergraduates in her research program.

Research: Professor Byon's research is broadly in the area of quality engineering and applied statistics. Her work has focused on models for wind turbine and wind system problems. In the course of this work, she has developed widely acclaimed research on importance sampling for optimizing systems whose performance can be evaluated only through large complex physics-based (black box) models. She has also made important contributions toward understanding the impact of wake effects on the performance of wind farms. She has 17 published or accepted refereed publications in very strong journals including *Technometrics*, *IIE Transactions*, *IEEE Transactions on Reliability*, and *Simulation*. At least three of these papers have won Best Paper awards and others have been recognized in other significant ways. She has an additional 10 refereed conference proceeding papers. She has four papers under review. She has been invited to give 15 presentations at peer institutions and additional presentations at national laboratories. Her work is funded by two NSF grants. She has also been a co-PI on an MCubed grant. She has three pending NSF grants including a CAREER proposal. Overall she has 363 citations and an h-index of 8 (Google Scholar).

Recent and Significant Publications:

Y. Choe, W. Guo, E. Byon, J. Jin and J. Li, "Change-point detection on solar panel performance using thresholded LASSO," *Quality and Reliability Engineering International*, 2016, Accepted.

M. You, E. Byon, J. Jin, and G. Lee, "When wind travels through turbines: a new statistical approach for characterizing heterogeneous wake effects in multi-turbine wind farms," *IISE Transactions on Quality and Reliability Engineering*, 2016, Accepted.

Y. Choe, E. Byon, and N. Chen, "Importance sampling for the reliability evaluation with stochastic simulation models," *Technometrics*, Vol. 57, No. 3, pp. 351-361, 2015.

E. Byon, "Wind turbine operations and maintenance: A tractable approximation of dynamic decision making," *IIE Transactions on Quality and Reliability Engineering*, Vol. 45, No. 11, pp. 1188-1201, 2013.

E. Byon and Y. Ding, "Season-dependent condition-based maintenance for a wind turbine using a partially observed Markov decision process," *IEEE Transactions on Power Systems*, Vol. 25, No. 4, pp. 1823-1834, 2010.

Service: Professor Byon has a strong record of service to the department and the profession. She has served on the elected IOE Department Committee and has been an active member of the Graduate Admissions and Financial Aid committee. She serves as an elected officer on the INFORMS (Institute for Operations Research and the Management Sciences) Quality, Statistics, and Reliability Council. She is sought after as a referee.

External Reviewers:

Reviewer A: "The quality of Prof. Byon's research is excellent. … For me, the value and impact of her work is great for both research and applications."

Reviewer B: "The papers she wrote then…are now considered seminal works in the area of wind turbine O&M. …Eunshin's excellent research is impactful…"

Reviewer C: "Dr. Byon's adaptation for wind turbine maintenance is the best use of POMDP for diagnosis and maintenance of any system I've seen…It is very important to note that this and her other work on maintenance has gotten significant attention by industry."

Reviewer D: "…The quality of Dr. Byon's research is truly outstanding. …She has already established as a leading researcher in operation research and management science as well as in renewable energy."

Reviewer E: "I will state that the work presented in the journal article (J4) is truly outstanding and will surely have an impact on wind turbine design…"

Reviewer F: "Dr. Byon's research made a real impact in the wind energy industry. …striving for excellence is really a hallmark in Dr. Byon's professional development. …I deem this paper one of the breakthroughs concerning importance sampling methods for stochastic simulations… Dr. Byon's research portfolio is exceptional in every regard."

Reviewer G: "…this work is the first of its kind in advancing the theory and practice of using black-box stochastic simulators for reliability assessment in complex engineering systems…"

Summary of Recommendation: Professor Byon is an accomplished researcher, teacher, and colleague. She has amassed an impressive overall record and all indications are that she will continue to be a strong and productive colleague. It is with the support of the College of Engineering Executive Committee that I recommend Eunshin Byon for promotion to associate professor of industrial and operations engineering, with tenure, Department of Industrial and Operations Engineering, and associate professor of civil and environmental engineering, without tenure, Department of Civil and Environmental Engineering, College of Engineering.

Alec D. Gallimore, Ph.D.
Robert J. Vlasic Dean of Engineering
College of Engineering

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