Approved by the Regents May 21, 2015

PROMOTION RECOMMENDATION
The University of Michigan
College of Engineering
Department of Naval Architecture and Marine Engineering

Yin Lu (Julie) Young, associate professor of naval architecture and marine engineering, with tenure, Department of Naval Architecture and Marine Engineering, College of Engineering, is recommended for promotion to professor of naval architecture and marine engineering, with tenure, Department of Naval Architecture and Marine Engineering, College of Engineering.

Academic Degrees:

Ph.D.	2002	The University of Texas at Austin, Civil and Environmental Engineering, Austin, TX
M.S.E.	1998	The University of Texas at Austin, Civil and Environmental Engineering, Austin, TX
B.S.	1996	University of Southern California, Civil Engineering, Los Angeles, CA

Professional Record:

2009 – present	Associate Professor (with tenure), Department of Naval Architecture and Marine Engineering, University of Michigan
2009	Visiting Associate Research Scientist, Department of Naval Architecture and Marine Engineering, University of Michigan
2009	Senior ASEE-ONR Summer Faculty Fellow, Naval Surface Warfare Center, Carderock Division, Maryland
2008	UPS Visiting Professor, Department of Civil and Environmental Engineering, Stanford University
2002 - 2009	Assistant Professor, Department of Civil and Environmental Engineering, Princeton University

Summary of Evaluation:
Teaching: Professor Young is an enthusiastic and dedicated teacher and mentor. She has taught the first-year college-wide course, Engineering 100: Introduction to Engineering, and has developed a graduate course in advanced marine hydrodynamics, NA520: Wave Loads on Ships and Offshore Structures. She has exhibited a strong commitment to motivating first-year students to become future STEM professionals and to exciting graduate students about complex fluid-structure interactions. Professor Young's Q1 and Q2 scores for ENG100 average over 4.0. The student letters had nothing but praise for Professor Young and her teaching of ENG100. For the graduate course, NA520, the Q1 and Q2 scores have averaged over 4.0 as well, continuously trending upward to 4.5/4.5 for fall 2013. Again, student letters describe Professor Young as a professor concerned about student learning and willing to take extra effort to engage students in the learning process. Professor Young's undergraduate and graduate advising and one-on-one Ph.D. mentoring has been strong. She has graduated four Ph.D. students and has a student who recently defended.

Research: Professor Young's research activities are extensive, varied, and substantial. Her efforts have focused on the numerical and physical modeling of multiphase flows and composite marine structures. Her seminal work in this area includes: 1) identification of the different flow regimes and governing physics of supercavitating and surface-piercing propellers; and 2) development of a three-dimensional Boundary Element Method (BEM) for the transient analysis of supercavitating and surface-piercing propellers. Her research efforts have expanded into the growing field of "self-adaptive structures." By leveraging her previous work on hydroelasticity and flexible marine propulsors, Professor Young's potential for a leadership position in this area is large.

While at the University of Michigan, Professor Young, as a project director or a co-PI, has made or is making significant contributions to 18 research projects. The total value of University of Michigan funds that she was or is personally responsible for is greater than $3.4M. The sources of Professor Young's research funds include the Office of Naval Research (ONR), the Naval Engineering Education Center (NEEC), and NSF.

Professor Young's research activities have supported masters students, doctoral students, and postdoctoral fellows. Her publication record is at a high level, both in terms of quantity and quality – over 65 archival journal publications, over 45 refereed conference papers. What is particularly impressive is the manner in which her research is also reflected in the undergraduate course she has helped redesign, Section 600 of ENG100.

Recent and Significant Publications:

E.J. Chae, D.T. Akcabay, and Y.L. Young, "Dynamic Response and Stability of a Flapping Foil in a Dense, Viscous Fluid," *Physics of Fluids*, Vol. 25, no. 104106, 2013.

B. Huang, A. Ducoin, and Y.L. Young, "Physical and Numerical Investigation of Transient Cavitating Flows around a Pitching Hydrofoil," *Physics of Fluids*, Vol. 25, no. 102109, 2013.

D.T. Akcabay and Y.L. Young, "Hydroelastic Response and Energy Harvesting Potential of Flexible Piezoelectric Beams in Viscous Flow," *Physics of Fluids*, Vol. 24, 054106, 2012.

M.R. Motley and Y.L. Young, "Performance-Based Design and Analysis of Flexible Composite Propulsors," *Journal of Fluids and Structures*, Vol. 27, pp. 1310-1325, 2011.

M.R. Motley, Z. Liu, and Y.L. Young, "Utilization Fluid-Structure Interactions to Improve Energy Efficiency of Composite Marine Propellers in Spatially Varying Wake," *Composite Structures*, Vol. 90, 304-313, 2009.

Y.L. Young, "Fluid-Structure Interaction Analysis of Flexible Composite Marine Propellers," *Journal of Fluids and Structures*, Vol. 24, No. 6, pp. 799-818, 2008. (2^{nd} most cited paper in *Journal of Fluids and Structures* since 2008)

Service: Professor Young has made important service contributions to both the university and to professional organizations. In addition to serving on the departmental Ph.D. qualifying exams committees, she was also a member of the departmental Chair Search Committee and the Marine/Naval Computational Fluid Dynamics Junior Faculty Search Committee. Professor Young has a significant national and international service portfolio. She was or is active in service roles including: representative of the U.S. National Committee on Theoretical and

Applied Mechanics (USNC/TAM); member, co-chair, or chair of numerous conferences, workshops, and symposia committees; and invited speaker at national and international meetings and conferences.

External Reviewers:
Reviewer A: "The quantity and the significance of her research activity is excellent."

Reviewer B: "She is clearly a rising star in the Naval Hydrodynamics area, and is well ahead of any other young researcher in similar areas that I know of."

Reviewer C: "I would rank her among the top of her field, particularly because of her practical understanding of the relevance of her research in the real world."

Reviewer D: "She is very good in selecting important problems, planning their solutions and bringing the solutions and analysis to practice."

Reviewer E: "I would consider Dr. Julie Young at the top 1-2% among her contemporaries in computational modeling of fluid-structure interactions problems in the civil and marine engineering field. …I would consider the academic accomplishments by Dr. Young are comparable to those who would be promoted to full professor with tenure at any top universities in this country and abroad."

Summary of Recommendation: Professor Young has an active and vibrant research program, is dedicated to teaching and maintaining high standards in student mentoring, and has strong university, national, and international service. It is with the support of the College of Engineering Executive Committee that I recommend Yin Lu (Julie) Young for promotion to professor of naval architecture and marine engineering, with tenure, Department of Naval Architecture and Marine Engineering, College of Engineering.

David C. Munson Jr.

David C. Munson, Jr.
Robert J. Vlasic Dean of Engineering
College of Engineering

May 2015