

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

David J. Singer, 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.	2003	University of Michigan, Naval Architecture and Marine Engineering, Ann Arbor, MI
M.S.	2001	Industrial and Operations Engineering, University of Michigan, Ann Arbor, MI
M.E.	1997	Naval Architecture and Marine Engineering, University of Michigan, Ann Arbor, MI
B.S.	1995	Naval Architecture and Marine Engineering, University of Michigan, Ann Arbor, MI

Professional Record:

2016 – present	Associate Professor, Naval Architecture and Marine Engineering, University of Michigan
2010 – 2016	Assistant Professor, Naval Architecture and Marine Engineering, University of Michigan
2006 – 2010	Adjunct Assistant Professor, Naval Architecture and Marine Engineering, University of Michigan
2006 – 2010	Assistant Research Scientist, Naval Architecture and Marine Engineering, University of Michigan
2004 – 2006	Manufacturing Analyst/Special Projects Manager, Engineering, Plastipak Packaging, Plymouth, MI

Summary of Evaluation:

Teaching: Professor Singer has developed or substantially revised three courses and has received notably high Q1/Q2/Q4 scores. He is considered an engaged faculty member who deeply connects with his students and a strong advocate for their growth and future success. Professor Singer applies DEI principles in his teaching and he helps other faculty with these principles in his role as the NAME's undergraduate program chair. He has graduated seventeen Ph.D. students as the chair or co-chair with another four in progress, including one who is expected to graduate this year. He has also served as a member of several other Ph.D. committees, advises masters and undergraduate students and postdoctoral scholars.

Research: Professor Singer has established a successful and active research program and has developed a clear identity in exploring design methods for complex naval ships. He is internationally known as the pioneer of Set-Based Design (SBD) methods for naval applications,

as well as the extension of this work into novel network-based views of the design process. Professor Singer and his group have had a worldwide impact, from the academic community to the highest levels of multiple governments. With cumulative totals of over \$40M in funding, and over 40 archival journal publications, Professor Singer's research team has been notably successful.

Recent and Significant Publications:

- M. Sypniewski and D. Singer, "A framework for evaluating inherent biases within ship design tools," *Ocean Engineering*, 07/2023; 284.
- A. Manohar and D. Singer, "State space scalability to enable smart ships with statistical physics and multi-agent-based reinforcement learning," *Computers and Informatics*, 07/2023; 3(2): 67-80.
- H. Yuan, P. Tripathi and D. Singer, "Physics incorporated transport evaluation for preliminary ship designs using ship-centric Markov decision process," *Naval Engineers Journal*, 12/2022; 134-4.
- L. Brownlow, C. Goodrum, M. Sypniewski, J. Collier and D. Singer, "A multilayer network approach to vulnerability assessment for early-stage naval ship design programs," *Ocean Engineering*, 04/2021; 255.
- A. Klishin, D. Singer and G. van Anders, "Avoidance, adjacency, and association in distributed systems design," *Journal of Physics: Complexity*, 04/2021; 2.

Service: Professor Singer has developed a sustained service record. He has served as the undergraduate program chair and mentored several student societies and competition teams. He served as the ABET chair and successfully completed the department's evaluative cycle with a "no shortcomings" assessment from ABET (the highest possible evaluation). He has edited the *Journal of Ship Production and Design* and has actively planned international conferences and NATO events. He is a fellow of SNAME and has received several awards from the primary technical societies in his field. He has served as a policy advisor on ship design and acquisition to the Australian and U.S. governments.

External Reviewers:

Reviewer A: "He is an active participant on the global maritime research arena, where he typically brings a strong team of younger colleagues and graduate students. He contributes substantially to the international visibility of both the University of Michigan and the US within the field of ships systems design and ship production, both related to naval and commercial ship design."

Reviewer B: "In my consideration of Dr. Singer's technical contributions in the areas of set based design and complex systems theory for naval ship design, as well as his teaching, service activities, and publications portfolio, I consider him to be at the top of his peer group."

Reviewer C: "My assessment is that Dr. Singer is one of the leading authorities on design theory applied to, and has no peers at the same stage of his career. Dr. Singer is truly an unique asset for the NAME Department."

Reviewer D: “With regard to the quality of his work, his contributions to developing and analyzing processes for designing complex ship systems have had an unusually high level of impact...As a consequence of this research program and subsequent work, the design process that Professor Singer initiated is now considered a Navy best design practice.”

Reviewer E: “Specifically, his papers and publications on set-based design have had one of the most exceptionally positive impacts on the naval ship design community that I have ever seen. Dr. Singer’s research and implementation guidance follow-through had a singular impact at the highest levels in the US Navy ship design and development community. ...His contribution to the field of naval engineering has been exceptional and continues to have a high impact and relevance to this day.”

Summary of Recommendation: Professor Singer has established himself as a global leader in the design of naval vessels as well as a masterful teacher and mentor. It is with the support of the College of Engineering Executive Committee that I recommend David J. Singer for promotion to professor of naval architecture and marine engineering, with tenure, Department of Naval Architecture and Marine Engineering, College of Engineering.



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