PROMOTION RECOMMENDATION
THE UNIVERSITY OF MICHIGAN
SCHOOL OF INFORMATION

Michael Nebeling, assistant professor of information, School of Information, and assistant professor of electrical engineering and computer science, College of Engineering, is recommended for promotion to associate professor of information, with tenure, School of Information, and associate professor of electrical engineering and computer science, without tenure, College of Engineering

Academic Degrees:

Ph.D.	2012	ETH Zurich, Zurich, Switzerland
M.S.	2007	Monash University, VIC, Australia

Professional Record:

2017 – present	Assistant Professor of Computer Science and Engineering, College of Engineering, University of Michigan
2016 – present	Assistant Professor of Information, School of Information, University of Michigan
2015 – 2016	Swiss NSF Advanced Postdoc.Mobility Researcher, Carnegie Mellon University, Pittsburg, PA
2012 – 2015	Senior Researcher and Lecturer, ETH Zurich, Department of Computer Science, Zurich, Switzerland

Summary of Evaluation:

Teaching: Professor Nebeling's teaching philosophy emphasizes experiential learning, built around course projects, agile development, design jams, and iterative prototyping. Professor Nebeling strives to create a constructive learning environment based on students' own creative exploration rather than top-down, lecture-based training. Building in a research sensibility, students are required to systematically study usability, and the content of his classes likewise allows for critical thinking. The structure of Professor Nebeling's courses allows students to leave with both the instrumental ability to design, and the discretion to think creatively about the choices they make. The course evaluations and feedback also show that the courses are challenging, and students have to work hard to get through the classes, yet despite the rigor there is consistent demand for these courses.

Overall, Professor Nebeling's curriculum development work in extended reality (XR) is an important addition to the course portfolio of UMSI. Professor Nebeling has been the primary leader and architect of the XR learning modules at UMSI, and at the university more broadly. His teaching covers the spectrum of design education in the XR space—he has designed and taught introductory classes on design principles for undergraduates and masters students, and domain-specific classes on XR application and design. His progress towards building this body of instructional work has been incremental and steady. He started with an individual course, extended that to a graduate certificate program in XR, and eventually broadened it to a Coursera specialization that has current enrollment in excess of 7000 students.

In terms of course evaluations, Professor Nebeling received an average of 4.65 on a five-point scale for the question regarding whether the course advanced students' understanding of the subject matter (Q1631) across 17 instances of his courses. This meets expectations for instructors in classes at UMSI. The style and structure of Professor Nebeling's courses as well as the record of his student mentoring show that he strongly values excellence in his lab and classrooms.

Research: Professor Nebeling's most significant research is his conceptualization of mixed reality (MR). To develop this conceptualization, he drew upon literature and interviews with experts from academia and industry to identify several contrasting notions of MR that only partially align with each other, and then distilled seven dimensions along which these disparate notions could be categorized.

Professor Nebeling primarily works in the area of user interface tools for novel interaction platforms, most recently in the emerging domain of XR. Prior to this, Professor Nebeling worked on tools for cross-device application design—i.e., applications that run simultaneously on multiple coordinated devices such as tablets and tabletops. His typical research approach involves identifying an emerging interaction paradigm, identifying requirements for improving the design process through formative research with domain experts and early adopters, building tools that embody those requirements, and evaluating the resulting tools in terms of their ability to improve the design process. A goal of Professor Nebeling's work, particularly in his more recent work on XR design, is to broaden participation in the design process by allowing individuals with a wider range of technical expertise to prototype, build, and evaluate candidate designs as efficiently and as expressively as possible. This approach is situated within the human-computer interaction (HCI) tradition of user interface tools research.

In terms of publication quantity, Professor Nebeling's CV lists 37 "heavily reviewed" conference papers and four peer-reviewed journal articles. Of the 41 conference papers and journal articles listed, 19 are in top-tier human-computer interaction (HCI) conferences (ACM CHI Conference on Human Factors in Computing Systems (CHI) and ACM Symposium on User Interface Software and Technology (UIST). Professor Nebeling's focus on top-tier HCI conferences is appropriate given his research topics, and his success in these conferences is an indication of the quality of his work and the high regard with which it is viewed by the field.

In terms of approach, output, and impact, Professor Nebeling meets expectations in the field of technical HCI. Some external reviewers describe him as an emerging leader, particularly in the area of XR design tools. His prominence is reflected in the fact that he has won two Best Paper and two Honorable Mention awards at CHI (three within the last two years), which is a rare accomplishment. He has also won numerous Best Paper/Honorable Mention awards at smaller, more focused conferences.

Recent and Significant Publications:
Michael Nebeling, Shwetha Rajaram, Liwei Wu, Yifei Cheng, Jaylin Herskovitz. "XRStudio: A Virtual Production and Live Streaming System for Immersive Instructional Experiences". *Proc. CHI Conference on Human Factors in Computing Systems*, May 2021, pg. 1-12.

Michael Nebeling, Maximilian Speicher, Xizi Wang, Shwetha Rajaram, Brian D. Hall, Zijian, Alexander R.E. Raistrick, Michelle Aebersold, Edwaed G. Happ, Jiayin Wang, Yanan Sun, Lotus Zhang, Leah Ramsier, Rhea Kulkarni. "MRAT: The mixed reality analytics toolkit." *In Proc. CHI Conference on Human Factors in Computing Systems*, April 2020, pg. 1-12, Best Paper Award.

Michael Nebeling, Katy Lewis, Yu-Cheng Chang, Lihan Zhu, Michelle Chung, Piaoyang Wang, Janet Nebeling. "XRDirector: A Role-Based Collaborative Immersive Authoring System." *In Proc. CHI Conference on Human Factors in Computing Systems*, April 2020, pg. 1-12, Best Paper Award.

Maximilian Speicher, Brian D. Hall, Michael Nebeling. "What is mixed reality?" In *Proceedings of the 2019 CHI Conference on Human Factors in Computing Systems*, pp. 1-15. 2019, Best Paper Award, Honorable Mention.

Service: Professor Nebeling has done strong service for his academic field as well. He served as the program co-chair for the ACM Symposium on User Interface Software and Technology (UIST) 2021, which is a remarkable service achievement for a pre-tenure faculty member. In addition to this role as the UIST co-chair, Professor Nebeling has served in multiple organizational capacities, including on program committees for the top conferences in his field, including CHI, UIST and the ACM SIGCHI Symposium on Engineering Interactive Computing Systems (EICS). These service roles further show the high regard in which he is held by his scholarly fields.

Professor Nebeling has done above average service at all levels in the university. At the school level, Professor Nebeling has been an active member of the Masters of Science in information (MSI) committee. At the university level, Professor Nebeling has been involved with multiple XR initiatives with the university, helping to develop cross-cutting programs in this area. This includes serving as the XR faculty innovator-in-residence with the Center for Academic Innovation. He is also been deeply involved with the university XR initiative, which has been building a network of XR-interested faculty across campus.

External Reviewers:
Reviewer A: 'Professor Nebeling is a very strong researcher…[He has] an impressive research output and impact…"

Reviewer B: "He is highly regarded in the community and has been entrusted on of the top honors of a [junior] rising academic in HCI: serving as papers chair for the UIST conference."

Reviewer C: "I strongly support his case for tenure, without any reservations, and believe he would have a strong case for tenure in my department."

Reviewer D: "In light of his achievements, outstanding quality of research and teaching, and roles of leadership, I think he will continue to make a considerable impact as a faculty member of UMSI in such a senior role."

Reviewer E: "[Professor] Nebeling has a strong vision of how mixed reality offers new opportunities for creating engaging, interactive experiences. His research statement and recent work also depict the exciting challenges ahead."

Reviewer F: "[Professor] Nebeling is a thoughtful researcher who is addressing what I believe are highly important problems which, because of their difficulty, do not get sufficient attention."

Reviewer G: "[Professor Nebeling] has demonstrated himself to be a world-class researcher in HCI and is fully deserving of promotion."

Summary of Recommendation:
Professor Nebeling's accomplishments in the areas of teaching, research, and service meet and exceed promotion and tenure requirements. Therefore, with the support of the Promotion and Tenure Committee of the School of Information and the Executive Committee in the College of Engineering, we enthusiastically recommend Michael Nebeling for promotion to associate professor of information, with tenure, School of Information, and associate professor of electrical engineering and computer science, without tenure, College of Engineering.

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Thomas A. Finholt
Dean, School of Information

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

May 2022