Approved by the Regents
May 18, 2023

PROMOTION RECOMMENDATION
THE UNIVERSITY OF MICHIGAN
SCHOOL OF INFORMATION

Christopher Brooks, assistant professor of information, School of Information, is recommended for promotion to associate professor of information, with tenure, School of Information.

Academic Degrees:

Ph.D.	2012	University of Saskatchewan, Saskatoon, SK, Canada
M.S.	2005	University of Saskatchewan, Saskatoon, SK, Canada
B.S.	2001	University of Saskatchewan, Saskatoon, SK, Canada

Professional Record:

2019 – present	Assistant Professor of Information, School of Information, University of Michigan
2015 – 2019	Research Assistant Professor of Information, School of Information, University of Michigan
2013 – 2015	Post-doctoral Researcher, School of Information, University of Michigan

Summary of Evaluation:
Teaching: Professor Brooks' teaching and mentoring exceed expectations for tenure. His teaching philosophy encourages individual autonomy, personal authenticity, and inclusivity through individualization. He has made major contributions to the University of Michigan School of Information (UMSI) through curriculum development in the area of data science, in UMSI's residential and online degree programs, most significantly in the design and implementation of the Master of Applied Data Science (MADS) program. In the Bachelor of Science in information he taught SI 330: Data Manipulation. In MADS, he was the lead instructor and course developer for several courses SIADS 505: Data Manipulation, SIADS 521: Visual Exploration of Data, and SIADS 687: Sports Analytics. His teaching both residentially and online has been innovative and effective.

Professor Brooks has been a leader in the development of key UMSI Massive Open Online Courses (MOOC) offerings. He played a critical role in the development of several new online MOOC specializations, such as Applied Data Science with Python; Sports Analytics (with Kinesiology); and Data Analytics in the Public Sector (with the Ford School of Public Policy). He is a recipient of UMSI's "Excellence in Instruction" Award in 2017 and a co-recipient of Coursera's "Outstanding Educator Award" for Innovation in 2018.

Professor Brooks has advised or co-advised a total of six doctoral students. His students have been his co-authors on several award-winning papers. He has also advised two post-doctoral scholars, each of whom is now well-placed: one at UC Irvine and one at the University of British Columbia. His first Ph.D. graduate is currently a post-doctoral fellow at the Massachusetts Institute of Technology Center for Transportation and Logistics. Professor Brooks has taught several courses across two UMSI degree programs.

Research: Professor Brooks' most significant research contributions are in the area of quantifying how learning behaviors and their contexts relate to desirable learning outcomes. He has created novel infrastructures in large-scale online settings, such as MOOCs, for doing this work including the creation of open data sets related to learning in MOOCs that facilitate replication. Professor Brooks employs primarily computational and quantitative research methodologies in his work, and the learning analytics context enables field-based experimental studies, which have been difficult to carry out. Professor Brooks' research has produced innovative learning metrics which are widely used to study online learning.

The shape and substance of Professor Brooks' work are above expectations within his fields of learning analytics, data science, and (more broadly) computer science. In these fields, heavily peer-reviewed conference papers in top venues are competitively reviewed and given equal weight to peer-reviewed journals. Since his appointment as an assistant professor in 2019, he has published 11 papers in peer-reviewed journals and 25 papers in top peer-reviewed conferences. He has also won four best conference paper awards (Conference on Computer Supported Cooperative Work and Social Computing (CSCW), Learning Analytics and Knowledge Conference (LAK), Learning at Scale (L@S), and Artificial Intelligence in Education and was cited for two honorable mentions for best paper at the ACM Conference on Human Factors in Computing Systems (CHI) and the MIDAS 2020 Reproducibility Challenge. Within the field of learning analytics and educational data mining, Professor Brooks' work is relatively well-cited for someone at his career stage. Professor Brooks has over 3,600 citations and an h-index of 32 according to Google Scholar (as of January 6, 2023). This places his citation count roughly in the middle of the pack of all scholars (at any rank) for those using the descriptor "Educational Data Mining" on Google Scholar and somewhat further back among those using the descriptor "Learning Analytics." He has also been successful with extramural funding. Professor Brooks has received two grants from the National Science Foundation (NSF), one as a principal investigator (PI) and the other as a co-PI. As a PI, he also received one award from the Spencer Foundation, and significant gifts from Microsoft, Google, and Michigan Institute for Data Science (MIDAS).

Recent and Significant Publications:

Li, W., Sun, K., Schaub, F., and Brooks, C. (2022). "Disparities in students' propensity to consent to learning analytics," *International Journal of Artificial Intelligence in Education*, *32*(3), pp. 564-608.

Singh, A., Brooks, C., Lin, Y., and Li, W. (2021). "What's In It for the Learners? Evidence from a Randomized Field Experiment on Learnersourcing Questions in a MOOC," *Proceedings of the Eighth ACM Conference on Learning@ Scale*, pp. 221-233.

Gardner, J., Brooks, C., and Baker, R. (2019, March). "Evaluating the fairness of predictive student models through slicing analysis," *Proceedings of the 9th international conference on learning analytics & knowledge*, pp. 225-234.

Wang, A. Y., Mittal, A., Brooks, C., and Oney, S. (2019). "How data scientists use computational notebooks for real-time collaboration," *Proceedings of the ACM on Human-Computer Interaction*, *3*(CSCW), pp. 1-30.

Gardner, J., and Brooks, C. (2018). "Student success prediction in MOOCs," *User Modeling and User-Adapted Interaction*, 28(2), pp. 127-203.

Service: Professor Brooks has provided service to his external research community through intellectual leadership roles at a level appropriate to (and at times exceeding) his rank. He served as a member of the Executive Board of the Society for Learning Analytics Research (SoLAR) from 2017-19. He also served as a senior program committee member multiple times for the SoLAR and LAK conferences and as the LAK overall co-program chair in 2019. He regularly served on the program committees for other key conferences in his field, including L@S and Artificial Intelligence in Education. He has provided "service through teaching" in the area of learning analytics through contributions to the Learning Analytics Summer Institute. At the 2021 L@S conference, Professor Brooks co-organized a workshop on "Designing Inclusive Learning Environments," to help promote diversity, equity, and inclusion in the field.

Professor Brooks has distinguished himself in service to UMSI and the university. Within UMSI, Professor Brooks served on the online programs committee and as a member of the MADS technical team. He has also served on various faculty search committees. Professor Brooks has also provided substantial service to the University of Michigan. He has been involved in institutional data governance related to teaching and learning, including service on the UM Information Technology Governance Council, where he helped formulate key institutional policies for access to key student learning data. Professor Brooks also acted as a reviewer for university grant programs through the Michigan Institute for Data Science (MIDAS) and the University of Michigan Office of Research (UMOR).

External Reviewers:
Reviewer A: "[Professor Brooks'] record of contributions and the quality of his work place him as one of the leading researchers in the areas of learning at scale, learning analytics, and e-learning."

Reviewer B: "…, Professor Brooks has an impressive research record, notable teaching, strong service to the community and outstanding promise for the future."

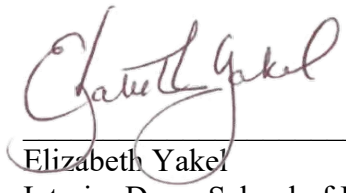
Reviewer C: "I certainly consider Gardner, Brooks, & Baker (2019), 'Evaluating the fairness of predictive student models through slicing analysis' published at LAK to be outstanding. [This] paper faces down matters of fairness in predictive models applied to educational contexts, situating the work in several broader conversations on the topic. I characterize the work as 'urgent' not only because it was among the first papers to empirically speak to this issue in education, but also because it exhibited the motivation to push through sensitive topical waters… [Professor Brooks] was similarly ahead of the curve in this co-authored paper on fairness in student model prediction…"

Reviewer D: "Professor Brooks has made several important contributions to understanding student success in digital and online environments. [Professor Brooks] is one of the top 2-3 scholars who address bias in this domain, and he has also made contributions to making such predictions both more practical and robust."

Reviewer E: "…, [Professor Brooks'] scholarship is comparable to the best [junior] faculty in his area."

Reviewer F: "Several of [Professor Brooks'] lines of work have been influential on our field: his efforts to develop resources to facilitate replication and support open science, his work on student success prediction in MOOCs, his work on algorithmic fairness, his work on [the] semantic web. Any one of these lines of research would be sufficient to recommend tenure."

Summary of Recommendation:
Professor Brooks' accomplishments in the areas of teaching, research, and service are well above the level expected of a junior faculty member for promotion and tenure. Therefore, with the support of the Promotion and Tenure Committee of the School of Information, I enthusiastically recommend Christopher Brooks for promotion to associate professor of information, with tenure, School of Information.



Elizabeth Yakel
Interim Dean, School of Information

May 2023