PROMOTION RECOMMENDATION
THE UNIVERSITY OF MICHIGAN
SCHOOL OF INFORMATION

Ceren Budak, 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   Computer Science, University of California, Santa Barbara
M.S.   2007   Computer Science, Bilkent University, Turkey

Professional Record:
2017 – present   Assistant Professor of Electrical Engineering and Computer Science, College of Engineering, University of Michigan
2015 – present   Assistant Professor of Information, School of Information, University of Michigan
2013 – 2015   Post-doctoral Researcher, Microsoft Research
2007 – 2012   Research/Teaching Assistant, University of California, Santa Barbara

Summary of Evaluation:
Teaching: Professor Budak's teaching philosophy emphasizes application and focuses on social, political and other real-world domains. The methods she uses in the classroom aim to help students gain realistic problem-solving and technical implementation experience, and encourage them to translate these skills into projects that demonstrate their competencies. In this way, a project-based approach allows them to gain deeper understanding than would be possible with short homework problems, while also building their portfolio in support of their careers.

Professor Budak's residential curriculum development at UMSI has focused on strengthening existing courses in the data science curriculum. As part of her updated Data Manipulation and Analysis class (SI 618), Professor Budak teaches two topics that are distinctive in the UMSI curriculum: large-scale computation and crowdsourcing. Her focus on crowdsourcing includes teaching students how crowdsourcing platforms operate, where labelled data comes from, the risks associated with human-generated labels, and how to collect reliable labelled data. In teaching data science methods, Professor Budak has also extended the curriculum to focus on their limitations and risks as well as their power. Example resources she uses to that end include humanist literature on crowdsourcing that details ethical concerns of that data gathering approach, and how data scientists can avoid exploitative practices when using crowdsourcing. She also includes articles and discussion on machine learning ethics, and teaches how social networks can result in inequality and echo chambers. Professor Budak is an active and committed research mentor. She is now advising seven Ph.D. students (as either sole advisor or co-advisor), all in good standing. Her students are making good progress at high quality research under her guidance. For example, out of 28 peer-reviewed publications published since joining

UMSI, 24 have been co-authored with students. Awards to her doctoral students include the Facebook fellowship and NSF Fellowship Honorable Mention. These doctoral students have also completed prestigious internships. Additionally, Professor Budak is active in mentoring undergraduate and masters students in research, including through her participation in an undergraduate research experience program Explore Computer Science Research (run by Girls Encoded at UM Computer Science and Engineering).

Since joining UMSI, Professor Budak has taught three small to medium-sized masters-level classes on data science topics that combine technical concepts with programming. These are: SI 608 Networks (six times, 20-30 students), SI 618 Data Manipulation and Analysis (four times, 30-50 students), and SI-699 Mastery on Big Data (three times, approximately 30 students). Course evaluations regarding whether the course advanced students' understanding of the subject matter (Q1631) indicate an upward trajectory in SI 608, which increased from 4.17 in Fall 2017 to 4.75 in Fall 2018, and 4.43 in Fall 2019. Her score for SI 618 also shows improvement over time, increasing from 4.5 in Fall 2017 to 4.75 in Fall 2019 and 4.83 in Fall 2020. Her third main course, Mastery of Big Data, has scored consistently above 4.0 each year she has taught it.

Research: Professor Budak's most significant research impact is in the modeling and empirical analysis of political misinformation and fake news. She has explored this in social media in addition to traditional news sources such as online news outlets, cable, and broadcast news outlets. Before most scholars were thinking about misinformation, in 2011 Professor Budak developed an information diffusion model with the goal of implementing a network campaign that would limit ongoing misinformation cascades. Furthermore, her work has found that the frequency of fake news increased during the 2016 presidential campaign, but more traditional news was produced and shared than fake news. In addition, she has identified important limitations in misinformation work that relies on third-party lists of low credibility sources to track problematic content, which is a common approach. She has shown that measuring the prevalence of fake news based on such lists can lead to inconsistent results. These empirical findings, enabled by her methodological approach, are her major research contributions.

Professor Budak's research is in the area of computational social science, and more specifically, in political communication. Her work develops computational methods to quantify various aspects of media and citizen communication and participation in political discourse. Professor Budak is an interdisciplinary scholar. She combines computational techniques, data analysis, and political science theory to significantly advance our understanding of media bias, political misinformation, civility in the political discourse, and information dissemination in political campaigns. More generally, she quantifies social science phenomena using computational social science tools including networks analysis, machine learning, and natural language processing.

The majority of Professor Budak's publications appear in rigorously peer-reviewed conference proceedings, as is the norm in her field. Her most frequent publication venues are the Proceedings of the International AAAI Conference on Web and Social Media (ICWSM) and the Proceedings of The Web Conference (WWW), which are the leading conferences in Computational Social Science and have acceptance rates of around 20%. Professor Budak also publishes in other prestigious conferences such as the ACM Conference on Computer-Supported Cooperative Work and Social Computing (CSCW) and journals such as *Science Advances* and

New Media & Society.

Professor Budak has successfully secured external funding for her research agenda, including the prestigious NSF CAREER award for her project titled "Large-Scale Examination of Problematic Online Behaviors and Their Regulators." Professor Budak has received numerous other grants; she has also been the principal investigator on an NSF Small grant, and a co-PI on three collaborative NSF grants.

Recent and Significant Publications:
Leticia Bode, Ceren Budak, Jonathan M. Ladd, Frank Newport, Josh Pasek, Lisa O. Singh, Stuart N. Soroka, and Michael W. Traugott. Words that matter: How the news and social media shaped the 2016 Presidential campaign. Washington, DC: Brookings Institution Press, 2020.
Lia Bozarth, Ceren Budak. "Beyond the Eye-Catchers: a Large-Scale Study of Social Movement Organizations' Involvement in Online Protests." *New Media & Society*. Vol. 23, No. 10, August 2020, pg. 3062-3083.
Ceren Budak, Sharad Goel, Justin M. Rao. "Fair and balanced? Quantifying media bias through crowdsourced content analysis," *Public Opinion Quarterly*, Vol. 80, No. S1, 2016, 250-271.
Ceren Budak. "What happened? The Spread of Fake News Publisher Content During the 2016 U.S. Presidential Election," *World Wide Web Conference (WWW '19)*, May 2019, pg. 139-150.
Julia Mendelsohn, Ceren Budak, David Jurgens. "Modeling Framing in Immigration Discourse on Social Media*," Proceeding of the 2021 Conference of the North American Chapter of the Association for Computational Linguistics: Human Language Technologies (NAACL-HLT)*, June 2021, pg. 2219-2263.

Service: In the past five years, Professor Budak has expanded her intellectual leadership roles helping to shape the field of computational social science at the national and international levels. Her "home" community is found at the International AAAI Conference on Web and Social Media (ICWSM). At the ICWSM conference, Professor Budak served as a senior program committee member for two years (2017, 2018), then program committee co-chair in 2019, before accepting her current role as the editor-in-chief of a new journal-based venue for the ICWSM conference in 2019. Professor Budak also served as senior program committee chair for the Web Conference, and Program Committee member for the AAAI Conference on Artificial Intelligence (AAAI), Conference on Human Computation and Crowdsourcing (HCOMP), and International ACM Conference on Web Search and Data Mining (WSDM).

Professor Budak has distinguished herself in service to the university. She has served on a number of important school committees, including an elected role on the UMSI Dean's Advisory Committee 2020-202, data science-related search committees, and the Diversity Strategic Planning Committee. Professor Budak also co-founded the Information Analysis and Retrieval seminar series. At the university level, Professor Budak served on the Advanced Research Computing Advisory team (2017-2019).

External Reviewers:

Reviewer A: "Professor Budak's record would clearly be in the top decile of this distribution in terms of productivity, quality, and impact."

Reviewer B: "…[Professor] Budak is an outstanding researcher, as is evident by her prestigious publications, an excellent teacher and mentor, plus a model citizen for the professional community."

Reviewer C: "The body of research that [Professor] Budak has pursued during her tenure-track years builds upon successful research directions she had the vision to pursue as a student and then postdoc, and it keeps evolving and maturing."

Reviewer D: "…, I believe [Professor] Budak is successfully positioning herself as a prominent scholar in the field of Computational Social Science."

Reviewer E: "[Professor Budak] has also been quite successful by any measure, professionally: with respect to organizing committees of conference, advising students, editorial boards, grants, invited talks. There really is not a weak spot on her record."

Summary of Recommendation:

Professor Budak'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 Ceren Budak 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.

_____
Thomas A. Finholt
Dean, School of Information

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

May 2022