

PROMOTION RECOMMENDATION
The University of Michigan
College of Engineering
Department of Electrical Engineering and Computer Science

Necmiye Ozay, assistant professor of electrical engineering and computer science, Department of Electrical Engineering and Computer Science, College of Engineering, is recommended for promotion to associate professor of electrical engineering and computer science, with tenure, Department of Electrical Engineering and Computer Science, College of Engineering.

Academic Degrees:

Ph.D. 2010 Northeastern University, Electrical Engineering, Boston, MA
M.S. 2006 The Pennsylvania State University, Electrical Engineering, University Park, PA
B.S. 2004 Bogazici University, Electrical and Electronic Engineering, Istanbul, Turkey

Professional Record:

2013 – present Assistant Professor, Department of Electrical Engineering and Computer Science, University of Michigan
2010 – 2013 Post-doctoral Scholar, Control and Dynamical Systems, California Institute of Technology, Pasadena, CA
2008 Visiting Researcher, Advanced Control Systems, The Polytechnic University of Catalonia, Terrassa, Barcelona, Spain

Summary of Evaluation:

Teaching: Professor Ozay is an outstanding educator. She has taught control systems courses at both the undergraduate (EECS 460) and graduate (EECS 560) levels, and has created the new graduate-level course EECS 563 Hybrid Systems: Specification, Verification and Control. Her Q1 and Q2 teaching evaluations average 4.65 and 4.78, respectively. She has supervised more than 20 undergraduate research projects, including SURE students and Marian Sarah Parker Scholars. These projects have resulted in nine conference papers and one journal publication. She graduated her first Ph.D. student in 2017, with two more expected to graduate in 2019. She has an impressive group of doctoral, Master's, and undergraduate students she supervises closely. In recognition of her excellence in teaching and scholarship, Professor Ozay was awarded the 1938E (CoE) and the Henry Russel Award (UM) in 2018.

Research: Professor Ozay's expertise lies in the field of feedback control engineering for dynamical systems. She has developed powerful techniques to model, design and test cyber-physical systems (CPS), with a focus on autonomy, safety, and resilience. Her research program ranges from theoretical investigations of CPS, to software implementation of the algorithms resulting from these investigations, and ultimately to real-world demonstration. Professor Ozay has firmly established herself as a well-recognized scholar both for the depth and breadth of her research. Her h-index and citation count (21 and over 1300 per Google Scholar) are very strong. Professor Ozay has published 14 journal papers, and several more at selective conferences

considered journal quality: including six papers at HSCC and two at CVPR. She has won a most impressive series of research awards since joining our faculty. Her research program is well funded from a diverse set of sources (NSF, ONR, NASA, DARPA, US Army TARDEC, Toyota Research Institute, Ford Motor Co.).

Recent and Significant Publications:

- F. Harirchi, N. Ozay, “Guaranteed Model-Based Fault Detection in Cyber-Physical Systems: A Model Invalidation Approach,” *Automatica*, 93: 476-488, 2018.
- P. Nilsson, N. Ozay, J. Liu, “Augmented Finite Transition Systems as Abstractions for Control Synthesis,” *Journal of Discrete Event Dynamic Systems (Special issue on Formal Methods in Control)*, 27(2): 301–340, 2017.
- P. Nilsson, N. Ozay, “On a class of maximal invariance inducing control strategies for large collections of switched systems,” *20th International Conference on Hybrid Systems: Computation and Control (HSCC)*, 187-196, Pittsburgh, PA, 2017.
- P. Nilsson, N. Ozay, “Control synthesis for large collections of systems with mode-counting constraints,” *19th International Conference on Hybrid Systems: Computation and Control (HSCC)*, 205-214, Vienna, 2016.
- J. Liu, N. Ozay, “Finite Abstractions with Robustness Margins for Temporal Logic-Based Control Synthesis,” *Nonlinear Analysis: Hybrid Systems*, 22: 1-15, 2016.

Service: Professor Ozay’s contributions to service are equally outstanding. Her service at the department level has included multiple important committee assignments as well as student advising. At the college level, she has led initiatives (website, controls tea hour) to foster a sense of community and facilitating mentoring for controls faculty spread across various departments. Professor Ozay’s external service includes serving as an associate editor for the journal *DEDS* and on conference organizing and program committees.

External Reviewers:

Reviewer A: “Necmiye is highly active and visible in the Cyber-physical Systems community – an increasingly important area with diverse applications in manufacturing, infrastructure systems, medicine, etc. She has received several competitive young investigator awards, including the NSF CAREER Award, the ONR Young Investigator Award, and the DARPA Director’s Fellowship, which demonstrate her recognition in the field.”

Reviewer B: “In my view, she is one of the most visible researchers [of her cohort] working in control theory. ... She is a rising star in control theory, and an established and well known researcher in the CPS and formal methods communities.”

Reviewer C: “Her performance is exemplary...I have no doubt that she would receive tenure at [my institution] or at any other top-tier research university.”

Reviewer D: “She is a clear leader in our community and her case would be a strong and straightforward promotion and tenure case at [my institution]. ... Her collaborations with industry (Toyota and Ford) are a testament to her leadership in the field and indicative of real impact that

she is making and will continue to make.”

Reviewer E: “In my opinion, Prof. Ozay is simply the top researcher in the area of control/hybrid systems at her career stage and I fully recommend her promotion of Associate Professor with Tenure.”

Reviewer F: “It is clear from her research, teaching, service, and outreach records that she has an extremely strong record as an assistant professor, and I strongly support her promotion to Associate Professor with Tenure.”

Summary of Recommendation: Professor Ozay is an emerging leader in the field of control science and engineering. She has proven to be a very dedicated teacher and valued member of the community. It is with the support of the College of Engineering Executive Committee that I recommend Necmiye Ozay for promotion to associate professor of electrical engineering and computer science, with tenure, Department of Electrical Engineering and Computer Science, College of Engineering.



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

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