

PROMOTION RECOMMENDATION
The University of Michigan
College of Engineering
Department of Aerospace Engineering

Dimitra Panagou, assistant professor of aerospace engineering, Department of Aerospace Engineering, College of Engineering, is recommended for promotion to associate professor of aerospace engineering, with tenure, Department of Aerospace Engineering, College of Engineering.

Academic Degrees:

Ph.D. 2012 National Technical University of Athens, Mechanical Engineering, Athens, Greece
Diploma 2006 National Technical University of Athens, Mechanical Engineering, Athens, Greece

Professional Record:

2014 – present Assistant Professor, Department of Aerospace Engineering, University of Michigan
2013 Visiting Research Scholar, GRASP Laboratory, University of Pennsylvania, Philadelphia, PA
2012 – 2014 Post-Doctoral Research Associate, Coordinated Science Laboratory, University of Illinois at Urbana-Champaign, Champaign, IL

Summary of Evaluation:

Teaching: Professor Panagou is a dedicated teacher and mentor. She has taught three different courses, including a required undergraduate course (AERO348), a graduate aero course (AERO584), and a cross-listed service course (AERO551/EECS562). AERO584 has thrived under her instruction, with increasing enrollment from multiple departments and student appraisals increasing across her six offerings. For AERO551/EECS562, she has blended rigorous theory with real-world motivation, obtaining strong student appraisals. She is introducing a new course in Winter 2020 on multi-agent systems, building on her expertise in this growing area. As an advisor and mentor, she has worked with several M.S. and undergraduate students. She currently advises seven Ph.D. students with the first on track to defend this year and another two in 2021. Her Ph.D. students state Professor Panagou provides useful advice and guidance, helping them to mature as researchers. Her research mentees show strong productivity in terms of journal and conference papers in selective venues.

Research: Professor Panagou is an outstanding researcher in control and estimation for multi-agent systems, with application to safety-critical and time-critical systems in uncertain and adversarial environments. For instance, she has developed innovative control methods for multi-vehicle systems (applicable to mobile robots or fixed wing aircraft) that enable them to perform tasks, such as surveillance, while avoiding vehicle and obstacle collisions, keeping inter-vehicle communication links reliable, and satisfying constraints arising from limited field of view of vision sensors. These and other works are recognized as significantly extending the state-of-art.

Her productivity in publishing is evidenced by 17 journal papers, over 50 conference papers, and one book chapter. Professor Panagou has an h-index of 16 with 700 citations according to Google Scholar, 12 with 424 citations according to Scopus and 10 with 287 citations according to Web of Science. Her impact is reflected by invitations to present seminars at leading universities and other top venues. Her research has been facilitated with approximately \$2.6M in funding, including two prestigious grants, namely, an AFOSR Young Investigator award and a NASA Early Faculty Career Award. She has built a laboratory at Michigan that supports a wide range of projects, demonstrating theoretical advances with physical vehicles of several varieties.

Recent and Significant Publications:

- W. Bentz, D. Panagou, "A Hybrid Approach to Persistent Coverage in Stochastic Environments," *Automatica*, 1-12, in press.
- D. Panagou, M. Turpin, V. Kumar, "Decentralized Goal Assignment and Safe Trajectory Generation in Multi-Robot Networks via Multiple Lyapunov Functions," *IEEE Transactions on Automatic Control*, in press.
- D. Han, D. Panagou, "Robust Multi-task Formation Control via Parametric Lyapunov-like Barrier Functions," *IEEE Transactions on Automatic Control*. 1-15, in press.
- K. Garg, D. Panagou, "Finite-Time Estimation and Control for Multi-Aircraft Systems under Wind and Dynamic Obstacles," *AIAA Journal of Guidance, Control and Dynamics*, 42(7): 1489-1505, 2019.
- X. Ma, Z. Jiao, Z. Wang, D. Panagou, "3D decentralized prioritized motion planning and coordination for high density operations of micro aerial vehicles," *IEEE Transactions on Control Systems Technology*, 26(3):939-953, 2018.
- W. Bentz, T. Hoang, E. Bayasgalan, D. Panagou, "Complete 3-D Dynamic Coverage in Energy-constrained Multi-UAV Sensor Networks," *Autonomous Robots*, 42(4): 825-851, 2018.
- D. Panagou, "A distributed feedback motion planning protocol for multiple unicycle agents of different classes," *IEEE Transactions on Automatic Control*, 62(3): 1178-1193, 2017.

Service: Professor Panagou's service to the department, college, and profession is very good. She has served on faculty and chair search committees for four years, acted as a CoE/UM faculty representative on multiple occasions, and co-coordinated the Controls Seminar Series for two years. Professor Panagou contributes to a variety of outreach activities, is a core member of the Robotics Institute, and serves on Ph.D. committees for two students at NTNU in Norway and one student at KTH in Sweden. In addition, she helped organize and serve as an associate editor for multiple conferences and reviewer for several journals in her field.

External Reviewers:

Reviewer A: "...her work will have important ramifications to the broader field of autonomy. I fully expect her to emerge as a leader in the field of multi-robot systems and autonomy thereof."

Reviewer B: "She is a technically talented and creative researcher who manages to combine deep theoretical insights with complex and practically relevant experimental scenarios.... her inquiry into how to design robust and resilient distributed control strategies is on track to become one of the pillars on which the modern field of multi-agent robotics is being built."

Reviewer C: “Dmitri is an excellent researcher and I strongly support her promotion. ... I have little doubt that she would be promoted to Associate Professor at [my institution] or at any other top-tier University.”

Reviewer D: “She has addressed important practical issues such as robustness, energy awareness, and safety. I was particularly intrigued by her results on finite-time estimation, which appear quite novel.”

Reviewer E: “...Dimitra has developed a high quality research program, which combines theory and algorithms with experimental validation, for an important class of problems. She has a strong publication record, with papers in the top conferences and journals. I strongly recommend that she be promoted to Associate Professor with Tenure.”

Reviewer F: “The mathematical tools used by Mika and her students are highly non-trivial and takes time and effort to master. With her work, she has been – and continues to be – one of the most visible researchers [of her cohort] in the multi-robot controls area.”

Summary of Recommendation: Professor Panagou is passionate about teaching, she is a devoted mentor and educator, she is a collegial faculty member who provides valuable service to the department, college, and profession, and she is a respected researcher in her field recognized as an emerging leader. It is with the support of the College of Engineering Executive Committee that I recommend Dimitra Panagou for promotion to associate professor of aerospace engineering, with tenure, Department of Aerospace Engineering, College of Engineering.



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

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