

PROMOTION RECOMMENDATION
The University of Michigan
College of Engineering

Silvio Savarese, 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. 2005 California Institute of Technology, Electrical Engineering, Pasadena, CA
M.S. 2001 California Institute of Technology, Electrical Engineering, Pasadena, CA
B.S. 1998 University of Naples Federico II, Electrical Engineering, Italy

Professional Record:

2008-present Assistant Professor, Department of Electrical Engineering and Computer Science,
University of Michigan
2005–2008 Beckman Post-doctoral Fellow, Beckman Institute, University of Illinois, Urbana-
Champaign, IL

Summary of Evaluation:

Teaching: Professor Savarese has rebuilt a computer vision curriculum at the University of Michigan that had been dormant for years. During the five times he has offered the principal computer vision class, EECS 442, the enrollment has more than quadrupled, to 78 students in Fall 2012. The students come from several departments, reflecting the wide interest in computer vision. Students praise the application demonstrations in the course and the breadth of topics covered. Thanks to his course offerings, many graduate students are now able to minor in the computer vision area. Beyond the classroom, Professor Savarese has engaged several undergraduate students and high school students in research through the SURE and UROP programs. He has already graduated two doctoral students and chairs or co-chairs another eight. He has advised over 20 M.S. students, a remarkable number. His graduate students are having papers accepted at the most prestigious computer vision conferences, some of which have acceptance rates of only 5% for oral presentations. Professor Savarese has been particularly active in delivering short courses and tutorials in the computer vision community, having established “an impressive track record” in that regard, with his offerings described as “most engaging.” Furthermore, in Winter 2013, he is offering a Coursera computer vision course with over 10,000 enrolled students, which will further enhance the visibility of computer vision at Michigan.

Research: Professor Savarese has built an outstanding computer vision research program. He has made fundamental contributions to the problems of object recognition and scene understanding using 3-D shape and geometry as the foundation of object representation and recognition. He has exceptional strength in not only object recognition/detection and machine learning, but in 3-D reconstruction and multi-view geometry. His work has had tremendous impact on the core problems of object representation and recognition, and also on the closely related problems of detecting humans and recognizing their activities, classifying images, tracking objects, and practical applications such as construction site monitoring. This combination of fundamental contributions and applications has helped him be remarkably effective at raising external funding from NSF (including a CAREER Award), ONR, ARO, and DARPA. He co-founded a startup company based on his work on construction site monitoring. His group’s contributions

are consistently accepted at the most highly selective computer vision conferences and he has an excellent publication record. Professor Savarese's CV lists over 55 refereed conference or symposium papers.

Recent and Significant Publications:

- W. Choi and S. Savarese, "A Unified Framework for Multi-Target Tracking and Collective Activity Recognition," *Proceedings of European Conference of Computer Vision*, Vol. 7575, pp. 215-230, 2012.
- Y. Bao, M. Bagra, Y. Chao and S. Savarese, "Semantic Structure From Motion with Points, Objects, and Regions," *IEEE Conference on Computer Vision and Pattern Recognition*, 2012.
- M. Sun, Y. Bao and S. Savarese, "Object Detection with Geometrical Context Feedback Loop," *International Journal of Computer Vision*, 100(2):154-169, Nov. 2012.
- M. Sun, M. Telaprolu, H. Lee and S. Savarese, "An Efficient Branch-and-Bound Algorithm for Optimal Human Pose Estimation," *IEEE International Conference on Computer Vision and Pattern Recognition*, 1616-1623, 2012.
- W. Choi, K. Shahid and S. Savarese, "Learning Context for Collective Activity Recognition," *IEEE International Conference on Computer Vision and Pattern Recognition*, 3273-80, 2011.
- M. Golparvar-Fard, F. Pena-Mora and S. Savarese, "Integrated Sequential As-Built and As-Planned Representation with D4AR Tools in Support of Decision-Making Tasks," *Journal of Construction Engineering and Management*, 137(12): 1099-1116, Dec. 2011.

Service: Internally, Professor Savarese has served on the Computer Engineering Program Committee and the Electrical Engineering (EE) Systems Graduate Admissions committee. His expertise in computer vision is important to both of these roles. He has also provided valuable advice to the CSE division of EECS on faculty recruiting related to computer vision. The external reviewers all noted that Professor Savarese has an outstanding record of service to the computer vision community. In addition to the usual roles of reviewing papers for conferences and journals and reviewing proposals for the NSF, he has had unusually visible and active leadership roles, having co-edited a special issue of a computer vision journal, organized and co-chaired a workshop on computer vision held in Ann Arbor, and served as an area chair for the major computer vision conferences. The latter service points to his recognition in the field. Professor Savarese's initiatives and efforts are considered to have put the University of Michigan back on the map in computer vision.

External Reviewers:

Reviewer A: "Silvio's contributions to computer vision are foundational and brilliant...Silvio is one of the sharpest computer vision scientists I have seen in the last ten years. He is the clear pioneer and leader in the area of multiple view recognition and semantic structure from motion. He is the one who managed to combine geometry and probability in the most beautiful way."

Reviewer B: "...Silvio's research directly influenced the direction of my group."

Reviewer C: "Dr. Savarese is leading the community's revolution back to this far more promising paradigm...I consider Dr. Savarese to be one of the top 2-3 researchers [of his cohort] in computer vision in the world today."

Reviewer D: "Silvio is one of the strongest figures [of his cohort] in computer vision at present."

Reviewer E: "...his series of publications on exploiting the 3D structure (or layout) of object for recognition in 3D images may be the most complete attack on the problem."

Reviewer F: "I...would have loved to make the contributions he was able to make...Silvio's breakthrough idea is to extract a high-level description of the scene observed in the images..."

Reviewer G: "...several of Silvio's papers have been the most inspiring ones at recent conferences...I have no doubts that he will continue to be a highly productive researcher that will continue to contribute significantly to our field."

Reviewer H: "...his recent work on 3D object recognition and semantic reconstruction has hit the impact jackpot...His productivity in recent years has been astonishing...his case would sail through with flying colors in any top-ranked department worldwide."

Summary of recommendation: Professor Savarese is an outstanding researcher who is making fundamental innovations in the field of computer vision, as well as bridging that field with other application areas such as construction site monitoring. He is committed to education both locally and internationally, in both traditional and emerging modes, and his course enrollments are growing rapidly. He has made solid contributions in service to the university and is a particularly visible leader in the computer vision community. It is with the support of the College of Engineering Executive Committee that I recommend Silvio Savarese for promotion to associate professor of electrical engineering and computer science, with tenure, Department of Electrical Engineering and Computer Science, College of Engineering.



David C. Munson, Jr.
Robert J. Vlasic Dean of Engineering
College of Engineering

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