

PROMOTION RECOMMENDATION
The University of Michigan
College of Literature, Science, and the Arts

Asaf Cohen, assistant professor of mathematics, College of Literature, Science, and the Arts, is recommended for promotion to associate professor of mathematics, with tenure, College of Literature, Science, and the Arts.

Academic Degrees:

Ph.D.	2013	Tel Aviv University, Israel
M.Sc.	2008	Tel Aviv University, Israel
B.Sc.	2005	Tel Aviv University, Israel

Professional Record:

2019-present	Assistant Professor, Department of Mathematics, University of Michigan
2017-2019	Assistant Professor, Department of Mathematics, University of Haifa, Israel
2014-2017	Post-doctoral Assistant Professor, Department of Mathematics, University of Michigan
2013-2014	Viterbi Postdoctoral Fellow, Department of Electrical Engineering, Technion, Israel

Summary of Evaluation:

Teaching: Professor Cohen's teaching has been concentrated in the mathematical finance program, where there is high demand both at the undergraduate and graduate levels. He has taught six different courses, including a new course for undergraduates he designed himself. Three of the courses are at the graduate level. The teaching evaluations show that Professor Cohen has done an excellent job of teaching in all his courses. He has also been successful at attracting students to write their Ph.D. dissertations under his supervision. He has directed undergraduate research projects and is substantially involved with the professional master's program in Quantitative Finance and Risk Management.

Research: Professor Cohen has done important research in the area of stochastic control and differential game theory. His research has three specific directions: (a) queueing theory (related to traffic in networks); (b) models in finance and insurance; and (c) mean field game theory. External reviewers express a high opinion of his research, particularly his recent work in mean field games. His research program has been supported by grants from the Israel Science Foundation and the U.S. National Science Foundation.

Recent and Significant Publications:

Bayraktar, E., Cecchin, A., Cohen, A., & Delarue, F. (2021). Finite state mean field games with Wright-Fisher common noise. *Journal de Mathématiques Pures et Appliquées*, 147, 98-162.

Dolinsky, Y. & Cohen, A. (2022). A scaling limit for utility indifference prices in the discretized Bachelier Model. *Finance and Stochastics*, 26, 335-358.

Cohen, A. (2021). On singular control problems, the time-stretching method, and the weak-M1 topology. *SIAM Journal on Control and Optimization*, 59(1), 50-77.

Bayraktar, E., Budhiraja, A., & Cohen, A. (2019). Rate control under heavy traffic with strategic servers. *Annals of Applied Probability*, 29(1), 1-35.

Service: Professor Cohen has been very involved with the mathematical finance program at all levels: undergraduate, graduate, and post-doctoral. There are around ninety undergraduates, seventy master's students, and nine postdocs in the program. He is the Ph.D. advisor for four graduate students, has served on the department's Executive Committee, and continues to serve on the admissions committee for the professional master's program in Quantitative Finance and Risk Management. Beyond the university, he is regularly called upon to referee research papers for the journals in his field.

External Reviewers:

Reviewer (A): "Another important publication, with Bayraktar, Cecchin and Delarue, is the description of mean field games on a finite state space with a common noise of Fischer-Wright type...the paper is a beautiful combination of stochastic analysis (to describe the common noise) and PDEs...I consider that both papers are among more important recent publications in MFG theory."

Reviewer (B): "In summary, Asaf Cohen's written contributions are an excellent piece of scholarship, which is both mathematically challenging and of high applied values. In particular, the methods involved in his works are innovative and deep, and obviously have led to some significant improvements of the existing literature, with some of them being among the best results in the respective field to date."

Reviewer (C): "I am impressed by his work on queueing theory. To cite only one in particular, I would pick 'Rate Control under Heavy Traffic with Strategic Servers' (with Erhan Bayraktar and Amarjit Budhiraja) in the *Annals of Applied Probability* (2019)...To summarize, I see an excellent tenure case. I am reviewing several of these cases every year, and I can attest that this one is among the strongest and for sure would be a no-brainer at my own institution."

Reviewer (D): "Instead of discussing a specific paper, I would like to point out a quality that I find in all of [Professor Cohen's] works, and which is his ability to bring together, to a variety of contexts (finance, queueing, etc.), ideas from game theory, optimal control, and limit theory. His academic trajectory uniquely positions him to make these novel connections."

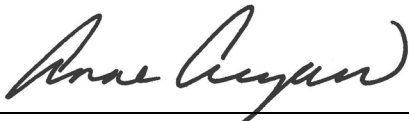
Reviewer (E): "[Professor Cohen's] work displays a mastery of all these sophisticated techniques and accordingly has led to an impressive publication record in the best journals of Applied Probability...Both in terms of quality and quantity, this places [him] among the most prolific researchers in his research area and age group."

Reviewer (F): "As such, the candidate's production can only be assessed as being of very high quality. I am also impressed by the scope of the topics considered by Asaf Cohen, ranging from mean-field game theory, reinforcement learning, limit theorems for Markov chains on networks, optimal control, mathematical finance, and even some problems stemming from statistics. For a

relatively [junior] researcher, such a breadth can only be lauded, especially since the results obtained in each area are both relevant and impactful.”

Summary of Recommendation:

Professor Cohen has a high-quality research program in stochastic control and differential game theory, and is recognized as a leading researcher in the field. In teaching, he plays an important role by his contribution to the mathematical finance program of the Department of Mathematics. He has performed major service work for the department. The Executive Committee of the College of Literature, Science, and the Arts and I recommend that Assistant Professor Asaf Cohen be promoted to the rank of associate professor of mathematics, with tenure, College of Literature, Science, and the Arts.



Anne Curzan, Dean
Geneva Smitherman Collegiate Professor of
English Language and Literature, Linguistics,
and Education
Arthur F. Thurnau Professor
College of Literature, Science, and the Arts

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