Approved by the Regents
May 18, 2017

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

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

Academic Degrees:

Ph.D.	2001	Princeton University, Computer Science, Princeton, NJ
M.A.	1999	Princeton University, Computer Science, Princeton, NJ
B.S.	1997	Beijing University, Computer Science, Beijing, China

Professional Record:

2009 – 2009	Senior Researcher, Baidu Inc., Beijing, China
2008 – present	Associate Professor, with tenure, Department of Electrical Engineering and Computer Science, University of Michigan
2002 – 2008	Assistant Professor, Department of Electrical Engineering and Computer Science, University of Michigan
2001 – 2002	Post-doctoral Scholar in Computer Science, Institute for Quantum Information at California Institute of Technology, Pasadena, CA

Summary of Evaluation:

Teaching: Professor Shi is a conscientious instructor who receives praise from his students for his patience and dedication. His teaching repertoire includes the core course on the theory of computation (EECS 376) with per-section enrollments typically exceeding 100 students, as well as upper-level and graduate-level courses on theoretical computer science (EECS 477, EECS 574). On the graduate student mentoring front, Professor Shi has established a vigorous research group and has chaired the dissertation committees of four Ph.D. students, three of whom have attained faculty positions in the U.S. and abroad. He has another four Ph.D. students in progress.

Research: Professor Shi is a prominent researcher in the area of quantum information systems. In particular, he has generated some of the most significant results on quantum protocols with untrusted devices for randomness generation and key distribution. Professor Shi has published his work at the most prestigious forums in his field. His theoretical work on trustworthy communications is considered innovative and deep, and has resulted in two issued U.S. patents.

Recent and Significant Publications:

Yaoyun Shi and Xiaodi Wu, "Epsilon-net method for optimizations over separable states," *Theoretical Computer Science*, 598:51-63, 2015.

Carl A. Miller and Yaoyun Shi, "Robust protocols for securely expanding randomness and distributing keys using untrusted quantum devices," *Proceedings of the 46th ACM Symposium on Theory of Computing (STOC)*, 2014.

Carl A. Miller and Yaoyun Shi, "Robust self-testing quantum states and binary nonlocal XOR games," *Proceedings of the 8th Conference on the Theory of Quantum Computation, Communication and Cryptography* (*TQC*), 2013.

Rahul Jain, Zhaohui Wei, Yaoyun Shi and Shengyu Zhang, "Correlation/Communication complexity of generating bipartite states," *Proceedings of the ACM-SIAM Symposium on Discrete Algorithms (SODA)*, 2013.

Brett Hemenway, Carl A. Miller, Yaoyun Shi and Mary Wootters, "On optimal entanglement assisted one-shot classical communication," *Physical Review A*, 87, 062301, 2013.

Service: Professor Shi has made substantial contributions to service. Internally, he has served on the faculty search committee and as an academic advisor for our undergraduates in computer science. Externally, he initiated a new conference on Trustworthy Quantum Information, which has enhanced both his and the university's research reputation in the emerging field of quantum computing. Since 2005, Professor Shi has served as a member of technical program committees for several conferences. From 2005 to 2008, he was the editor of *Theoretical Computer Science*, one of the top journals in his field. In addition, he often serves on proposal review panels for NSF.

External Reviewers:

Reviewer A: "I believe that Prof. Shi's publication and presentation record, professional standing in the community, teaching experience, and service to his school and to his peers are all more than sufficient to warrant his promotion to Full Professor with tenure."

Reviewer B: "Dr. Shi is a world leader in quantum information processing. He has a track record of excellent and influential results in this important and fascinating field. …Considering his international status this promotion is long due."

Reviewer C: "He has a well established reputation as an internationally leading researcher in quantum computation and quantum information theory. He is a researcher of impressive versatility and creative ability, having contributed a series of influential results that range over a remarkably wide breadth of issues in this cross-disciplinary area. In my opinion there are very few leading researchers who could equal the creative diversity at the level of high significance that is displayed in his research record."

Reviewer D: "I am truly impressed by the vision, quality, productivity and scholarly impacts of Prof. Shi's research. I characterize him as an original deep thinker. …if considered for promotion to the rank of Professor with tenure at my institution…Yaoyun would easily meet the requirements here."

Reviewer E: "Yaoyun has delivered an impressive set of work in quantum computing and information processing. His papers cover a remarkably large part of the domain, and some of them actually opened up new subfields in the area. He is clearly a leading researcher in quantum complexity and information theory."

Summary of Recommendation: Professor Shi has established a high-impact record of teaching, scholarly research and service at the University of Michigan. It is with the support of the College of Engineering Executive Committee that I recommend Yaoyun Shi for promotion to professor of electrical engineering and computer science, with tenure, Department of Electrical Engineering and Computer Science, College of Engineering.

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

May 2017