THE UNIVERSITY OF MICHIGAN
REGENTS COMMUNICATION

PROMOTION RECOMMENDATION

University of Michigan-Flint
College of Arts and Sciences
Department of Mathematics

Lixing Han, assistant professor of mathematics, Department of Mathematics, College of Arts and Sciences, is recommended for promotion to associate professor of mathematics, with tenure, Department of Mathematics, College of Arts and Sciences.

Academic Degrees:

Ph.D.	2000	University of Connecticut
M.S.	2000	University of Connecticut
M.S.	1997	University of Connecticut
M.S.	1987	Chinese Academy of Sciences, Beijing, China (jointly with Tianjin University)
B.S.	1985	Tianjin University, Tianjin, China

Professional Record:

2000 to Present	Assistant Professor, Department of Mathematics, University of Michigan-Flint
1995 to 2000	Teaching Assistant, Department of Mathematics, University of Connecticut
1990 to 1995	Lecturer, Department of Mathematics, Tianjin University
1988 to 1990	Assistant Lecturer, Department of Mathematics, Tianjin University

Summary of Evaluation:

Teaching – Dr. Han has taught a wide variety of courses, including introductory service courses (MTH 118 and 120), lower-division calculus courses which serve both mathematics majors and a broad range of other students (MTH 121, 122), and upper-level applied mathematics courses (MTH 305, 321, 374, 377, and 378). Student teaching evaluations demonstrate that he has done an excellent job with each of these audiences. Dr. Han's unique contribution to the Mathematics Department has been his leading role in the revival of its Actuarial Program, including course development and revision.

Research – Dr. Han has published seven research papers in the leading journals in his fields of interest, has another accepted for publication, and has written, by invitation (a high honor), a chapter in the *Handbook of Linear Algebra*. This is remarkable productivity for a mathematician. Further evidence of his prestige as a mathematician is his winning a prestigious Rackham Summer Research Fellowship in 2003.

Recent and Significant Publications:

Chen, M. Q., Han, L., and Neumann, M. "On single and double Soules matrices," submitted to *Linear Algebra and Its Applications*, April 2005.

Han, L., and Neumann, M. "Inner product spaces, orthogonal projection, least squares, and singular value decomposition," invited book section, completed in February 2005. To appear in *Handbook of Linear Algebra,* editor: L. Hogben, associate editors: R. Brualdi, A. Greenbaum, and R Mathias; CRC Press.

Catral, M., Han, L., Neumann, M. and Plemmons, R. "On reduced rank nonnegative matrix factorization for symmetric nonnegative matrices," *Linear Algebra and Its Applications*, Vol. 393, 2004, pp. 107–126.

Han, L. and Liu, G. "On the convergence of the UOBYQA method," *Journal of Applied Mathematics and Computing*, Vol. 16, No. 1–2, 2004, pp. 125–142.

Han, L. and Neumann, M. "Combining quasi-Newton and Cauchy directions," *International Journal of Applied Mathematics*, Vol. 12, No. 2, 2003, pp. 167–191.

Han, L., Neumann, M., and Xu, J. "On the roots of certain polynomials arising from the analysis of the Nelder-Mead simplex method," *Linear Algebra and Its Applications*, Vol. 363, 2003, pp. 109–124.

Han, L., Liu, G., and Jing, L. "Convergence properties of the DFP algorithm for unconstrained optimization," *Optimization*, Vol. 51, No. 2, 2002, pp. 731–758.

Han, L. and Liu, G. "A study of the Dennis-Wolkowicz method on convex problems," *Computational Optimization and Applications*, Vol. 19, 2001, pp. 297–317.

Han, L. and Neumann, M. "Effect of dimensionality on the Nelder-Mead simplex method," *Optimazation Methods and Software*, (available online since December 2004).

Han, L., Liu, G., and Jing, L. "A non-monotone Broyden method for unconstrained optimization," *Optimization Methods and Software*, Vol. 15, No. 2, 2001, pp. 153–172.

Han, L., Neumann, M., and Tsatsomeros, M. "Spectral radii of fixed Frobenius norm perturbations of nonnegative matrices," *SIAM Journal on Matrix Analysis and Applications*, Vol. 21, No. 1, 2000 (electronically 1999), pp.79-92.

Han, L., Liu, G., Jing, L., and Han, D. "A class of non-monotone conjugate gradient methods for unconstrained optimization," *Journal of Optimization Theory and Applications*, Vol. 101, No. 1, 1999, pp. 127-140.

Han, L., and Liu, G. "Global analysis of the Dennis-Wolkowicz least-change secant algorithm," *SIAM Journal on Optimization*, Vol. 8, No. 3, 1998, pp. 813-832.

Service – Dr. Han has served as coordinator of the Math Lab, our drop-in peer tutoring center, where he has hired and scheduled student tutors, and been an effective manager. He has served the College on the CAS Summer Interim Committee three different years, and served on the CAS Nominating Committee twice. He is a regular at CAS faculty meetings and at commencement. Though low-key, Dr. Han's service is constant, consistent, and effective.

External Reviewers:

Reviewer (A):

"... Dr. Han is a skilled mathematician who is working on interesting problems, and publishing in journals that are routinely read by other researchers in the area. In my view, Dr. Han's research record is solid, and his research program is clearly on track."

Reviewer (B):
"... he has done fundamental research on the Nelder-Mead simplex method which forms the core of the unconstrained minimization capability of MATLAB, the most widely used scientific software in the world! Equally notable is his research in matrix theory which has had substantial impact in that area as well."

Reviewer (C):
"The scholarly activity and professional development of Dr. Lixing Han are of a caliber that strongly supports his tenure case and his case for promotion to Associate professor."

Reviewer (D):
"Dr. Han's record is impressive. He has published a large number of papers since his thesis. These have been in high-impact mainstream journals."

Reviewer (E):
"... Dr. Han is a versatile researcher in different areas of applied mathematics. His papers are published in first rate journals in his field, ... (I may mention here that all these journals have a tough reviewing process and high rejection rates.) Dr. Han certainly is an internationally accepted scientist in these areas."

Summary of Recommendation:
Dr. Han teaches a difficult subject well, has engaged in curriculum and course revision and development, is an outstanding and prolific scholar, and performs valuable service in his department, and for the College and University. We therefore enthusiastically recommend Lixing Han to the title of associate professor of mathematics, with tenure, Department of Mathematics, College of Arts and Sciences.

D. J. Trela, Ph.D., Dean
College of Arts and Sciences

Recommendation endorsed by:

Jack Kay, Ph.D., Provost and
Vice Chancellor for Academic Affairs

Juan E. Mestas, Ph.D., Chancellor
University of Michigan-Flint

May 2006