Approved by the Regents
May 19, 2022

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

Johann Gagnon-Bartsch, assistant professor of statistics, College of Literature, Science, and the Arts, is recommended for promotion to associate professor of statistics, with tenure, College of Literature, Science, and the Arts.

Academic Degrees:

Ph.D.	2012	University of California, Berkeley
M.S.	2007	University of California, Berkeley
B.A./B.S.	2003	Stanford University

Professional Record:

2020-Present	Computational Medicine and Bioinformatics Affiliate Faculty
2015-Present	Assistant Professor, Department of Statistics, University of Michigan, Ann Arbor
2015-Present	Michigan Institute for Data Science Affiliate Faculty
2012-2015	Neyman Assistant Professor, Department of Statistics, University of California, Berkeley

Summary of Evaluation:

Teaching: Professor Gagnon-Bartsch has primarily taught Stats 280, Honors Introduction to Statistics, and Stats 500, a core Master's level course. He developed Stats 280, an honors version of the very large Stats 250 and our first honors course, which was an important contribution to the department. He is a thoughtful teacher with high standards who takes his teaching very seriously and encourages critical thinking in students. Professor Gagnon-Bartsch has mentored an unusually large number of Ph.D. students (eight) as well as unusually many undergraduates (16). He has successfully nurtured multiple students with applied interests, which has helped the department broaden its Ph.D. program.

Research: Professor Gagnon-Bartsch is an excellent applied statistician whose research is largely driven by questions from applications, primarily in genomics and bioinformatics as well as social studies. He has developed a collection of tools for "removing unwanted variation" (RUV) in genomic data, an often-neglected phenomenon that can completely invalidate downstream analyses, which has had a large impact in bioinformatics. He has also made both applied and methodological contributions to causal inference, an extremely challenging area that aims to establish causation, as opposed to correlation, from non-experimental data. His ideas in this field are especially novel, including an approach to ascertaining validity of putatively natural or matched comparisons and methods to augment experimental data with more easily available observational data, potentially gaining power with no additional cost. His work is finely tuned to applications at hand, requiring a true engagement with other disciplines, which is one of Professor Gagnon-Bartsch's special strengths. This type of work is a growth area in statistics.

Recent and Significant Publications:

Gagnon-Bartsch, J. A., and Shem-Tov, Y. (2019). The classification permutation test: A flexible approach to testing for covariate imbalance in observational studies. *The Annals of Applied Statistics*, *13*(3), 1464–1483.

Hunt, G. J., Dane, M. A., Korkola, J. E., Heiser, L. M., and Gagnon-Bartsch, J. A. (2020). Automatic transformation and integration to improve visualization and discovery of latent effects in imaging data. *Journal of Computational and Graphical Statistics*, *29*(4), 929–941.

Hunt, G. J., and Gagnon-Bartsch, J. A. (2021). The role of scale in the estimation of cell-type proportions. *The Annals of Applied Statistics*, *15*(1), 270–286.

Wu, E., and Gagnon-Bartsch, J. A. (2021). Design-based covariate adjustments in paired experiments. *Journal of Educational and Behavioral Statistics*, *46*(1), 109–132.

Service: Professor Gagnon-Barsch has served on department curriculum and admissions committees and as a faculty advisor to the campus-wide student MSSISS conference. His contributions to DEI include teaching in the Data Science Summer Institute, which aims to recruit URM undergrads, and helping with the NextProf program. He has refereed for many journals and organized conference sessions; overall, his service record is fully appropriate for the rank.

External Reviewers:

Reviewer (A): "He is a thoughtful applied statistician. This work [RUV] has gained him a vast visibility in the computational biology community…This research style brings great practical and methodological benefits; insightful observations and novel ideas about the data appeared in his methodological papers…A careful, deep thinker with the ability to solve practical problems."

Reviewer (B): "He is an excellent applied statistician that engages his collaborators and takes the time to understand the details and nuances of the application before developing methodology…He [has] all the skills and characteristics that I look for when hiring faculty in this area."

Reviewer (C): "His statistical methods are applicable to many of the thousands of new clinical trials started each year. His methods, which are applicable to many disease areas, have potential to substantially improve precision and power in clinical trials, at no added cost…His methods can lead to more efficient, faster, and more ethical clinical trials."

Reviewer (D): "It is his insight and consideration to the practical settings that makes him stand out from many other statistical bioinformaticians…In statistical bioinformatics, I would rank [Professor Gagnon-Bartsch] in the top 2% of researchers in the field."

Reviewer (E): "I believe Dr. Gagnon-Bartsch is doing exceptionally creative and important research in several applied statistical areas…In my observational studies class, I teach students about the classification permutation test and I consider the test a breakthrough."

Reviewer (F): "He has an extraordinary ability to get to the heart of important problems in applied statistics, and always shows great creativity."

Summary of Recommendation:
Professor Gagnon-Bartsch is an excellent, creative, and modern applied statistician, whose work has had a significant impact on several areas of application. The need for such research is high and is expected to continue to grow. He is a responsible and thoughtful teacher and advisor at all levels, and contributes consistently to the department and the profession through service. The Executive Committee of the College of Literature, Science, and the Arts and I recommend that Assistant Professor Johann Gagnon-Bartsch be promoted to the rank of associate professor of statistics, 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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