

PROMOTION RECOMMENDATION

The University of Michigan
School of Public Health
Department of Biostatistics

Xiaoquan W. Wen, assistant professor of biostatistics, Department of Biostatistics, School of Public Health, is recommended for promotion to associate professor of biostatistics, with tenure, Department of Biostatistics, School of Public Health, University of Michigan.

Academic Degree:

Ph.D. (Statistics)	2011	University of Chicago
M.S. (Computer Science)	2002	University of Illinois at Chicago
M.S. (Mathematics)	2000	University of Illinois at Chicago
B.S. (Chemical Physics)	2005	Peking University

Professional Record:

2011 - Present	Assistant Professor, Department of Biostatistics, University of Michigan
2002 - 2007	Research Computer Scientist, University of Chicago

Summary of Evaluation:

Teaching: Professor Wen is a versatile teacher who has taught some of the key courses in our graduate programs as well as courses that are close to his areas of research focus. He has taught BIOSTAT 680 (“Applied Stochastic Processes”) four times, with 16-22 students each time, and excellent evaluations of teaching effectiveness (Q2 ranging from 4.30 – 4.62); BIOSTAT 680 is one of the core courses in our doctoral program. Professor Wen has also taught BIOSTAT 699 (“Analysis of Biostatistical Investigations”) twice, a somewhat larger course with 40-44 students, and with comparable teaching effectiveness (Q2 ranging from 4.10 – 4.23). BIOSTAT 699 is the culmination of our Masters program, and challenges students to design a rigorous analysis plan, apply it to real data to solve open questions in Biostatistics, and interpret and present results. It is demanding for both students and faculty. Finally, Professor Wen has taught our doctoral level special topics class (BIOSTAT 830, “Methods and Applications of Statistical Learning” / “Statistical Methods for Analysis of High Throughput Sequencing Data”), introducing our doctoral students to cutting edge ideas and topics from his research area in genomics and high-dimensional data analysis.

Professor Wen is already active in doctoral student advising. Although none of his doctoral students have yet graduated, Professor Wen is a highly sought-after member for doctoral thesis committees, where he contributes energy and unique knowledge of Bayesian computation and genomics. He has served on nine doctoral committees since joining our faculty in 2011.

Research: Professor Wen works in the quickly developing field of statistics that seeks to develop and apply flexible methods for Bayesian computation to very large datasets. Within this rich and fertile research area, he has focused particularly on the analysis of genetic association studies, especially those studies that seek to connect very high dimensional genetic data to also very high dimensional gene expression outcomes, on integrative analyses that combine different types and

sources of information, and on efficient computational methods and software that enable Bayesian methods to be deployed widely. The methods developed by Professor Wen are important for scientists to extract value and knowledge from the datasets that can now be generated and combine both very large amounts of genomic information and similarly detailed accounts of gene expression levels. These datasets help scientists understand the genome, identify the biological consequences of disease associated genetic variants and, ultimately, obtain the knowledge that will allow us to precisely regulate and manipulate gene expression in medical interventions of the future.

Professor Wen has 30 published articles (including nine as first author). Among these publications, more than 20 are in absolutely top journals including *Science*, *Annals of Applied Statistics*, *Biostatistics*, *Biometrics*, *Nature Genetics*, *Nature Communications*, *American Journal of Human Genetics*, *PLoS Biology*, *PLoS Genetics*, and *Bioinformatics*). Eighteen of Professor Wen's papers (including five where he is first author) have already received multiple citations. Notable among these is a diverse set of methodological papers (Wen et al, *Annals of Applied Statistics*, 2010; 30 citations; Wen and Stephens, *Annals of Applied Statistics*, 2014; 20 citations; Wen and Nicolae, *Bioinformatics*, 2008; 16 citations; Wen, *Biometrics*, 2014; 15 citations) and some very high profile consortium papers describing systematic efforts to understand the regulation of gene expression across many tissues in the GTEx Consortium (GTEx Consortium, *Nature Genetics*, 2013; 521 citations; GTEx Consortium, *Science*, 2015; 364 citations). The GTEx Consortium specifically sought out Professor Wen's expertise in the design and analysis of experiments that seek to understand regulation of gene expression and to compare the underlying regulatory processes across tissues.

Recent and Significant Publications:

- Wen, X, Lee Y, Luca F, Pique-Regi R. (2016) Efficient integrative multi-SNP association analysis via deterministic approximation of posteriors. *American Journal of Human Genetics*, 98(6):1114 - 1129. PMID: 27236919.
- Wen, X, Luca, F, Pique-Regi, R. (2015) Cross-population joint analysis of eQTLs: Fine mapping and functional annotation. *PLOS Genetics*, 11(4):e1005176. PMID: 25906321.
- Wen, X. (2015) Bayesian model comparison in genetic association analysis: linear mixed modeling and SNP set testing. *Biostatistics*, 6(4):701–712. PMID: 25796429.
- Wen X, Stephens M. (2014) Bayesian methods for genetic association analysis with heterogeneous sub-groups: from meta-analyses to gene-environment interactions. *Annals of Applied Statistics*, 8(1):176-203.
- Wen X. (2014) Bayesian model selection in complex linear systems, as illustrated in genetic association studies. *Biometrics*, 70(1):73-83. PMID: 24350677.

Service: Professor Wen is also a regular contributor beyond the department. He has chaired sessions at the American Society of Human Genetics Annual Meeting (the premier meeting for statistical and computational research related to human genetics), the Eastern North America Region Biometrics Society Annual Meeting (another premier meeting for the Biostatistics community), and helped organize the 2015 GTEx Community Meeting (GTEx is a large NIH-funded effort to systematically dissect gene expression across >50 tissues in hundreds of

individuals). In addition to these roles, he is a regular reviewer for several top journals both in the areas of biostatistics and statistical genetics and genomics.

External Reviewers:

Reviewer A: “[He] is clearly on a path to become one of the leaders in the field of statistical genetics. He has a talent for identifying important and cutting-edge topics in statistical genetics and developing innovative analytical approaches to address these topics.”

Reviewer B: “Dr. Wen is an outstanding researcher who spans both traditional statistics and statistical genetics. What is impressive is that the underlying Bayesian framework that Dr. Wen developed is very elegant and comprehensive for tackling multiple problems ...”

Reviewer C: “In my opinion, Dr. Wen has demonstrated outstanding scholarship and recognition, and he has made invaluable contributions to our discipline through research, teaching and service. A person with his track record and qualification would be recommended for promotion to associate professor at my institution.”

Reviewer D: “His work on statistical approach for multi-tissue expression quantitative trait loci (eQTL) mapping and integrative genetic association method incorporating functional genomic annotations, all published in top journals, is considered the current state of the art in the field.”

Reviewer E: “I regard William’s research to be among the very best in the field of statistical and computational genetics. A notable feature of William’s research is that he has developed a number of software packages that implement his work and methods.”

Reviewer F: “...a considerable strength is the high quality of technical work produced by Dr. Wen, including several outstanding high-impact publications. In light of these outstanding publications, Dr. Wen has a strong standing in relation to others in his peer group.”

Summary of Recommendation: Professor Wen is an extremely valuable contributor to the university and the department. He has made creative and important contributions to methodology for analysis of genetic studies and Bayesian computation. Furthermore, he is an outstanding teacher and is very active in service to the profession. It is with the support of the School of Public Health Executive Committee that I recommend Xiaoquan W. Wen for promotion to associate professor of biostatistics, with tenure, Department of Biostatistics, School of Public Health.



Martin A. Philbert, Ph.D.
Dean, School of Public Health

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