PROMOTION RECOMMENDATION
The University of Michigan
School of Public Health
Department of Biostatics

Jian Kang, associate professor of biostatistics, with tenure, Department of Biostatistics, School of Public Health, is recommended for promotion to professor of biostatistics, with tenure, Department of Biostatistics, School of Public Health.

Academic Degrees:

Ph.D.	2011	University of Michigan
M.S.	2007	Tinghua University
B.Sc.	2005	Beijing Normal University

Professional Record:

2017-Present	Associate Professor, Department of Biostatistics, University of Michigan
2017-Present	Adjunct Associate Professor, Department of Biostatistics and Bioinformatics, Emory University
2015-2017	Assistant Professor, Department of Biostatistics, University of Michigan
2015-2017	Assistant Professor, Kidney Epidemiology and Cost Center, University of Michigan
2015-2017	Adjunct Assistant Professor, Department of Biostatistics and Bioinformatics, Emory University
2011-2015	Assistant Professor, Departments of Biostatistics and Bioinformatics, Radiology and Imaging Sciences, Center for Biomedical Imaging Statistics, Emory University
2007-2011	Research Assistant, Department of Biostatistics, University of Michigan

Summary of Evaluation:

Teaching – Since his promotion to associate professor, Professor Kang has taught high-level advanced courses on computational and Bayesian methods to biostatistics graduate students (BIOSTAT 615 and 682). His courses are very popular on campus, even beyond biostatistics, and have received excellent student evaluations. He is a co-leader of the Big Data Summer Institute (BSDI) at Michigan, and he is one of three co-principal investigators (PI) on a National Institutes of Health R25 grant that supports the BDSI. Professor Kang is one of the most sought-after doctoral advisers for biostatistics graduate students. He has mentored or co-mentored fourteen Ph.D. students, eight of whom have already completed their Ph.D. and six are currently working under his supervision. He currently chairs or co-chairs seven doctoral committees, and has been a member of four others. Six of his publications have been first-authored by his mentees, and, three of these papers won student awards from professional societies.

Scholarship – Professor Kang is well known for his high-quality work, developing intricate, elegant and clever Bayesian modeling approaches for functional and complex data analysis, motivated by challenging biomedical applications, particularly in neuroimaging and metabolomics. He is actively involved in collaborations at the University of Michigan Kidney Epidemiology and Cost Center (UM-KECC) where he has taken a lead in optimizing algorithms

and implementing massively parallel computing techniques to speed up analysis of big biomedical data. This has led to 30-50 times faster computation for many routine analyses in UM-KECC. Professor Kang is also involved in the Direct Brain Interface Laboratory in Michigan Medicine, where he is developing methods for the brain computer interface system and has active collaborations in an ongoing study on opioid use.

Professor Kang is currently funded via nine active grants, including as the PI on two internal grants (one from the Michigan Institute for Clinical and Health Research and one from the University of Michigan Office of Research). He is the University of Michigan subcontract PI on a R01, and a multiple-PI on a second R01 grant, a R25 grant, and a MCubed grant. This is an outstanding track record of funding as a PI. He is also the co-investigator on three additional current awards. While in rank, Professor Kang has given 18 invited presentations at multiple locations across the globe including Italy, China, Australia, and the United States. Professor Kang has published a total of 72 papers, including 23 papers since 2017. Of the latter, 18 are methods papers and five are application papers. Among the 18 methods papers, he is first author on three of the papers and last/corresponding author on an additional nine papers; also, one of his advisees is first author on six papers. Professor Kang's manuscripts have appeared in some of the most respected journals in the profession, including the *Journal of the American Statistical Association* (*JASA*), *Biometrika*, *Annals of Applied Statistics*, *Bayesian Analysis*, *Biometrics*, *Journal of Multivariate Analysis*, *Statistica Sinica,* and *Statistics in Medicine*, as well as in many influential field-specific journals like *Neuroimaging*, *Bioinformatics*, and *IEEE Transactions on Medical Imaging*.

Recent and Significant Publications:
Kang J., Bowman F.D., Mayberg H., Liu H. (2016) A depression network of functionally connected regions discovered via multi-attribute canonical correlation graphs. *NeuroImage*. 41:431-441.
Kang J., Hong G.H., Li Y. (2017) Partition-based ultrahigh dimensional variable screening, *Biometrika*. 104(4) 785-800.
Kang J., Reich B.J., Staicu A.M. (2018) Scalar-on-image regression via the soft thresholded Gaussian process. *Biometrika*. 105(1):165-184.
Jin Z., Kang J., Yu T. (2018) Missing value imputation for LC-MS metabolomics data by incorporating metabolic network and adduct ion relations. *Bioinformatics*. 34(9):1555-1561
Cai Q., Kang J., Yu T. (2019) Bayesian variable selection over large scale networks via the thresholded graph Laplacian Gaussian prior with application to genomics. *Bayesian Analysis*, In Press

Service – Professor Kang has engaged in significant service at all levels since his promotion to associate professor in 2017. He has served on multiple committees in the Department of Biostatistics, including the candidacy committee, the admissions committee, and an open-rank search committee. He chaired the computing committee for 2018-19. He also served on the health data science initiative committee. Professor Kang is an active member of both the American Statistical Association (Section on Statistical Imaging) and the Eastern North American Region of the Biometrics Society. He has taken on several key assignments within these organizations, especially with helping to organize the scientific programs for their annual

conferences. He is also serving as the associate editor for two well-regarded journals in biostatistics (*Biometrics* and *Statistics in Medicine*).

External Reviewers:
Reviewer A: "I would view Jian as one of the top statisticians/biostatisticians internationally in the field of functional data analysis and Bayesian modeling of complex highly-structured functional data."

Reviewer B: "The impact of Dr. Kang's research is confirmed by his ability to secure a considerable amount of grant funding for his methodological developments. He is also routinely invited to the most relevant national and international conferences in statistical imaging."

Reviewer D: "In my opinion, this is an outstanding case for full professor promotion. Professor Kang is a top-notch researcher in his peer [group], and he is an ideal candidate for the Mortimer Spiegelman award, a very prestigious award for biostatisticians [of his generation]."

Reviewer E: "In addition, to his academic work, Dr. Kang has performed exemplary service to the statistics community, including student mentoring, reviewing, and involvement in the neuroimaging statistics community."

Reviewer F: "Even though this is an early promotion, his record already surpasses the full professor hurdle at the major US research universities in terms of both quality and quantity. With seven more substantial paper[s] under submission or revision, his output shows no sign of slowing."

Reviewer G: "This combination of methodological, computational, theoretical, and applied skills is rare to see all at once in a researcher – even most very successful researchers have significant weaknesses in one or more of these areas but Dr. Kang does not. In terms of other practical matters, he has shown the ability to obtain extramural funding …, has given numerous talks…, is associate editor for two leading statistical journals…, and has been asked to review literally dozens of…submissions. All of this demonstrates how he has established himself as a leader and is recognized as such with a national or even international reputation."

Reviewer H: "He is recognized among the top researchers in Bayesian biostatistics. Besides his research output, this is evident from frequent invitations at relevant workshops and departmental seminars."

Reviewer I: "Dr. Kang is only eight years past completing his PhD. Many successful academicians at that point in their careers have just recently been promoted to the rank of Associate Professor, but Dr. Kang seems to have an accelerated timeline relative to the majority of his cohort. His achievements are impressive…"

Reviewer J: "In addition to being a strong researcher, he has demonstrated leadership within the statistics in imaging community through the Section on Statistics in Imaging within the American Statistical Association. He has established a solid record of mentorship of graduate students and has served as a good role model for the new cohort of 'neuro-statisticians.'"

Reviewer K: "What I like about Jian's work is that it represents an ideal blend of statistical rigor, computational sophistication and real world relevance. His publication record is quite outstanding, particularly for someone who earned his PhD only in 2011…He has an excellent record in terms of winning competitive grants as well."

Reviewer L: "Prof. Kang's academic research is highly innovative and stands at the cusp of integrating stochastic processes and advancing computing technology to attack complex biological problems involving imaging, metabolomics and genetics. Prof. Kang's accomplishment surpass many others at a similar or higher career-stage."

Reviewer M: "Dr. Kang is a very mature researcher, who has made significant contributions to the field of statistics, and in particular in Bayesian models selection, graphical models and applications in Biostatistics and Neuroimaging. His research shows an excellent balance of methodological and applied work. His current research agenda is extremely exciting."

Summary of Recommendation:
Professor Kang is a highly prolific and productive statistician, who has established himself as a leading expert in Bayesian statistics, variable selection, graphical models, methods for large-scale complex biomedical data and efficient computational algorithms. Professor Kang has sustained a high quality of scholarly work over the course of his career that has both realized and further potential impact on statistics and neuroscience. In addition to being a strong researcher, he has demonstrated leadership within the department, school, and the professional statistics in imaging community. Professor Kang has been a pivotal instructor in the Department of Biostatistics and has established an outstanding record of mentorship of both graduate and undergraduate students. It is with the support of the School of Public Health Executive Committee that we recommend Jian Kang for promotion to professor of biostatistics, with tenure, Department of Biostatistics, School of Public Health.

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F. DuBois Bowman, Ph.D.
Dean, School of Public Health

May 2020