

PROMOTION RECOMMENDATION
The University of Michigan
College of Engineering

Valeriy Y. Ivanov, assistant professor of civil and environmental engineering, Department of Civil and Environmental Engineering, College of Engineering, is recommended for promotion to associate professor of civil and environmental engineering, with tenure, Department of Civil and Environmental Engineering, College of Engineering.

Academic Degrees:

Ph.D.	2006	Massachusetts Institute of Technology, Hydrology and Hydroclimatology, Cambridge, MA
M.S.	2002	Massachusetts Institute of Technology, Hydrology, Cambridge, MA
Diploma	1996	Moscow State University, Hydrology, Russia

Professional Record:

2007 – present	Assistant Professor, Department of Civil and Environmental Engineering, University of Michigan
2006 – 2007	Post-doctoral Fellow, Harvard University, Cambridge, MA
2006	Post-doctoral Associate, Massachusetts Institute of Technology, Cambridge, MA

Summary of Evaluation:

Teaching: Professor Ivanov is a very good mentor and teacher, both inside and outside of the classroom. He has introduced one new course and substantially modified another with each enhancing the graduate experience in the area of hydrology at the University of Michigan. His graduate student mentoring has been exemplary and the impact of his efforts in undergraduate and graduate education is high. Professor Ivanov's dedication to undergraduate teaching is best exemplified by his regular teaching of a required, senior level class, CEE 421, Hydrology and Floodplain Hydraulics. He regularly has undergraduates working in his lab and directs undergraduate research projects. Student letters testify to the fact that Professor Ivanov is a dedicated teacher who is willing to mentor students inside and outside of the classroom. His course evaluations have been solid and are continually improving. Professor Ivanov's performance in teaching has been recognized with a 2011 Civil and Environmental Engineering Excellence Award.

Research: Professor Ivanov works in the area of computational hydrology and the development of physics-based models for watershed dynamics. His major contribution is the development and extension of the tRIBS model, incorporating distributed vegetation dynamics and carbon budgets in dry land systems where water is limited. He also has a significant field component to his research that is critical for testing computer models. His work has very high visibility and he is recognized as a strong researcher in hydrology by external reviewers. His research results are consistently published in high-impact journals in hydrology, water resources and earth systems engineering. He has given invited talks on his research throughout the world at both peer institutions and international conferences. He has published 24 articles in peer-reviewed journals that have been frequently cited. He has also published 54 articles in national and international conference proceedings, several of which were by invitation. Professor Ivanov received an NSF CAREER Award in 2012.

Recent and Significant Publications:

- Kim, J., Ivanov, V. Y. and Katopodes, N., (2012), "Hydraulic resistance to overland flow on surfaces with partially submerged vegetation," *Water Resources Research*, 48, W10540, doi:10.1029/2012WR012047.
- Fatichi, S., Ivanov, V. Y. and Caporali, E., (2012), "A mechanistic ecohydrological model to investigate complex interactions in cold and warm water controlled environments. 1. Theoretical framework and plot-scale analysis," *Journal of Advances in Modeling Earth Systems*, doi:10.1029/2011MS000086.
- Kim, J., Ivanov, V. Y., Warnock, A. and Katopodes, N., (2011), "Coupled modeling of hydrologic and hydrodynamic processes including overland and channel flow," *Advances in Water Resources*, doi:10.1016/j.advwatres.2011.11.009.
- Fatichi, S., Ivanov, V. Y. and Caporali, E., (2011), "Simulation of future climate scenarios with a weather generator," *Advances in Water Resources*, doi:10.1016/j.advwatres.2010.12.013.
- Vivoni, E. R., Mascaro, G., Mniszewski, S., Fasel, P., Springer, E. P., Ivanov, V. Y. and Bras, R. L., (2011), "Real-world hydrologic assessment of a fully-distributed hydrological model in a parallel computing environment," *Journal of Hydrology*, 409, 483–496.
- Ivanov, V. Y., Fatichi, S., Jenerette, G. D., Espeleta, J. F., Troch, P. A. and Huxman, T. E., (2010), "Hysteresis of soil moisture spatial heterogeneity and the 'homogenizing' effect of vegetation," *Water Resources Research*, 46, W09521, doi:10.1029/2009WR008611.
- Flores, A. N., Ivanov, V. Y., Entekhabi, D. and Bras, R. L., (2009), "Impact of hillslope-scale organization of topography, soil moisture, soil temperature and vegetation on modeling surface microwave radiation emission," *IEEE Transactions on Geoscience and Remote Sensing*, 47(8), 2557-2571.
- Ivanov, V. Y., Bras, R. L. and Vivoni, E. R., (2008), "Vegetation-hydrology dynamics in complex terrain of semiarid areas: I. A mechanistic approach to modeling dynamic feedbacks," *Water Resources Research*, 44, W03429, doi:10.1029/2006WR005588.
- Noto, L. V., Ivanov, V. Y., Bras, R. L. and Vivoni, E. R., (2008), "Effects of initialization on response of a fully-distributed hydrologic model," *Journal of Hydrology*, 352, 107–125, doi:10.1016/j.jhydrol.2007.12.031.
- Ivanov, V. Y., Bras, R. L. and Curtis, D. C., (2007), "A weather generator for hydrological, ecological, and agricultural applications," *Water Resources Research*, 43, W10406, doi: 10.1029/2006WR005364.

Service: Professor Ivanov's service contributions to the University and professional societies at the national and international levels are consistent with our expectations. He has served as a member of the Graduate and Information Technology committees of the Department of Civil and Environmental Engineering. Furthermore, Professor Ivanov has had an active role in several committees of the American Geophysical Union. He has served on "invitation only" workshop panels sponsored by NOAA and DOE, as well as NASA and NSF review panels. In addition, Professor Ivanov has served as a reviewer to several scientific journals and received the 2010 Editors' Citation for Excellence in Refereeing for *Water Resources Research*. Finally, as service to the community, he has taught a series of weekly science lectures and hands-on experiments for 7th grade students at Whitmore Lake Middle School, Whitmore Lake, Michigan.

External Reviewers:

Reviewer A: "...I view Valeriy Ivanov as a rising academic star who has already made very significant contributions to the field in a set of different areas of ecohydrology. Given his record to date and his trajectory, I expect him to continue to be among the leaders in the field integrating distributed catchment processes with ecohydrologic carbon and energy exchange, and geomorphic development. He has accomplished and gone beyond everything expected of an assistant professor."

Reviewer B: “What sets Dr. Ivanov’s work apart in distributed hydrologic modeling is the explicit inclusion of plant biophysics to allow for plant growth and for the partitioning of soil evaporation and transpiration to yield the spatial pattern across a watershed of soil moisture, vegetation density, and evapotranspiration (ET). Others who have built spatial hydrologic models have parameterized ET, which is difficult enough, rather than treat it dynamically as has Dr. Ivanov.”

Reviewer C: “Dr. Ivanov has demonstrated through his research that he has the ability to address important problems of scientific and societal concern, such as climate change impacts, with the rigor of an engineer who demands quantitative answers and uncertainty estimation. His recent involvement in two studies in the Arctic (with the Russian Academy of Sciences) and in the Amazon rainforest in Brazil, promise unique research opportunities via comparison and contrast from two diverse environments.”

Reviewer D: “Valeriy has achieved significant visibility in the hydrologic community, both because he has made an effort to engage fully in the community and because his work has had significant impact.”

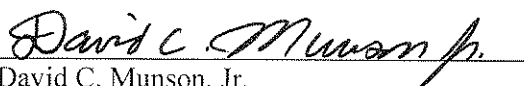
Reviewer E: “I think his work is quite good. He has published in well regarded journals, and has established a network that clearly is growing.”

Reviewer F: “This paper will make a significant impact within the hydrologic model development community, of which I am a part. It addresses an important problem, and rectifies a previously known deficiency in the unstructured mesh flow routing scheme used in earlier versions of the tRIBS model.”

Reviewer G: “In my view he is an excellent numerical analyst and programmer and has refined a number of aspects related to surface hydrology and modeling with so-called dynamic plant canopies.”

Reviewer H: “...I recommend without reservation the promotion of Mr. Ivanov to associate professor. He has clearly established himself as a leader in the field of ecohydrology, and is perhaps peerless when it comes to the computational aspect of this field. He has abundant promise for professional growth, both in terms of future collaborative opportunities as well as advancing his own research agenda.”

Summary of Recommendation: Professor Ivanov is a very prominent and very productive hydrological engineer who has made significant contributions to the field of watershed dynamics. He is an excellent teacher and mentor and he is a leader who contributes both in external and internal service. It is with the support of the College of Engineering Executive Committee that I recommend Valeriy Y. Ivanov for promotion to associate professor of civil and environmental engineering, with tenure, Department of Civil and Environmental Engineering, College of Engineering.


David C. Munson, Jr.
Robert J. Vlasic Dean of Engineering
College of Engineering

May 2013