



Spring 2010 Distinguished Lecture Series

Mining Climate and Ecosystem Data: Challenges and Opportunities

Vipin Kumar
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11am-12pm, Wednesday, April 21
TECH Center 111

Abstract: Climate change has become the defining issue of our era. There is an increasing consensus that greenhouse gas emissions resulting from the use of fossil fuels as well as human-induced changes to the ecosystem (e.g. deforestation) are the cause of global warming, which in turn, can have dramatic consequences such as increased occurrence of extreme weather events, shocks in food and water supplies, rising sea levels. This has created an urgent need to improve our ability to answer questions such as: (i) what is the impact of global warming on the frequency, intensity and duration of extreme events such as heat waves, droughts, floods, hurricanes, large scale forest fires; (ii) what is the impact of deforestation and other land cover changes on the global carbon cycle; (iii) what is the relationship of crop prices to deforestation dynamics and greenhouse gas emissions. There is a significant interest in the ability to answer such questions from a large community that includes climate and environmental scientists, policy makers and just as importantly, the society at large. Data sets that can help us answer such questions are becoming increasingly available from remote sensors like satellites and weather radars, or from in situ sensors and sensor networks, as well as outputs of climate or Earth system models from large-scale computational platforms. However, to be able to fully realize the potential benefits of these data sets, a number of computational challenges in spatio-temporal data mining (STDM) need to be addressed.

This talk will highlight opportunities and challenges for the data mining community in addressing these questions of urgent societal interest. We will discuss a number of applications that exemplify some of the most important questions faced by the climate and ecosystem scientists today and the role the data mining community can play in answering them. Research is supported by NSF, NASA, NOAA, Minnesota Futures Program, and Planetary Skin Institute.

Bio: Vipin Kumar is currently William Norris Professor and Head of Computer Science and Engineering at the University of Minnesota. His research interests include High Performance computing and data mining. He has authored over 250 research articles, and co-edited or coauthored 10 books including the widely used text book "Introduction to Parallel Computing", and "Introduction to Data Mining" both published by Addison-Wesley. Kumar has served as chair/co-chair for over a dozen conferences/workshops in the area of data mining and parallel computing. In 2001, Kumar co-founded SIAM International Conference on Data Mining and served as its steering committee chair until 2007. Kumar is a founding co-editor-in-chief of Journal of Statistical Analysis and Data Mining, editor-in-chief of IEEE Intelligent Informatics Bulletin, and series editor of Data Mining and Knowledge Discovery Book Series published by CRC Press/Chapman Hall. Kumar is a Fellow of the AAAS, ACM and IEEE. He received the 2009 Distinguished Alumnus Award from the Computer Science Department, University of Maryland College Park, and 2005 IEEE Computer Society's Technical Achievement Award for contributions to the design and analysis of parallel algorithms, graph-partitioning, and data mining.

Refreshments will be served!