

Fall 2014 Seminar Series

Presented by the CS Division

**OAK RIDGE BIO-SURVEILLANCE TOOLKIT (ORBiT):
USING "BIG DATA" MACHINE LEARNING IN PUBLIC HEALTH DYNAMICS**
MONDAY SEPTEMBER 8, 2014 1:30 PM – HEC 101

We will present an overview of Oak Ridge Bio-surveillance Toolkit (ORBiT), which we have developed specifically to address data analytic challenges in the realm of public health surveillance. The digitization of health related information through electronic health records (EHR) and electronic healthcare claim reimbursements (eHCR) and the continued growth of self-reported health information through social media provides both tremendous opportunities and challenges in developing novel public health surveillance tools. ORBiT provides an extensible environment to pull together diverse, large-scale datasets and analyze them to identify spatial and temporal patterns for various bio-surveillance related tasks. We demonstrate the utility of ORBiT in automatically extracting a small number of spatial and temporal patterns during the 2009-2010 pandemic H1N1 flu season using eHCR data. These quantitative insights obtained using ORBiT show how the eHCR data combined with novel analytical techniques can provide important information to decision makers when an epidemic spreads throughout the country.

LAUREN PULLUM AND ARVIND RAMANATHAN
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Dr. Laura Pullum is a senior research scientist in the Computational Data Analytics Group at the Oak Ridge National Laboratory. Her research experience is in software-intensive system dependability and intelligent systems. She is currently conducting research in the evaluation, verification and validation of predictive analytics and machine learning systems, and R&D of ORBiT, the Oak Ridge Biosurveillance Toolkit. Prior to joining ORNL, she worked in industry, at a non-profit research institute, as a visiting professor, and as a small business owner.

Dr. Pullum has authored numerous publications including 3 books, served on NSF review panels, has one patent, serves on advisory boards, and serves on the standards working group for IEEE P1012-201X Standard for System Verification and Validation. She is a member of the IEEE Computer Society. She holds a BS in Math, an MS in Operations Research, an MBA and a doctorate in Systems Engineering and Operations Research.

Arvind Ramanathan is a staff scientist in the Computational Data Analytics Group at Oak Ridge National Laboratory. He obtained his PhD from Carnegie Mellon University and a MS in computer Science from Stony Brook University. His research interests include the interdisciplinary areas of computer science and biology.

Hosted by: Dr. Sumit Jha

