



# Fall 2010 Colloquium

## Temple University

### Computer and Information Sciences

Tuesday 10/26, 11am, Tech Center 111:

**Predrag Radivojac, Indiana University:**

***Towards predicting molecular cause of disease from amino acid substitutions***

**Abstract:**

Advances in high-throughput genotyping and next generation sequencing have generated vast amounts of human genetic variation data. Single nucleotide substitutions within protein coding regions are of particular importance due to their potential to give rise to amino acid substitutions that affect protein structure and function which may ultimately lead to disease. Over the last decade, a number of computational methods have been developed to predict whether such amino acid substitutions result in an altered phenotype, but are not well suited to providing probabilistic estimates of the underlying disease mechanism. In this talk I will present our (supervised, kernel and non-kernel) methods for predicting functionally important amino acid substitutions from protein sequence and structure. I will argue that the molecular cause of disease can be confidently predicted in about 10% of currently available disease-associated mutations and that some hints on the molecular mechanisms can be obtained in as many as 50% of mutations. I will discuss significant both algorithmic issues and differences in the patterns of amino acid substitutions between inherited disease, somatic disease and putatively neutral polymorphisms.

**Bio:**

Predrag Radivojac, Associate Professor of Informatics and Computing, Indiana University - Bloomington. Prof. Radivojac received his Bachelor's and Master's degrees in Electrical Engineering from the University of Novi Sad and University of Belgrade, Serbia. His **Ph.D. degree is in Computer Science from Temple University (2003)** under the direction of Prof. **Zoran Obradovic** and co-direction of Prof. Keith Dunker. In 2004 he held a post-doctoral position in Keith Dunker's lab at Indiana University School of Medicine, after which he joined School of Informatics and Computing, Indiana University - Bloomington. Prof. Radivojac's research interests are in the areas of protein function, MS/MS computational proteomics, and machine learning. He received an NSF CAREER Award in 2007 and his projects are currently supported by NSF and NIH