

Friday, Nov 12, 2010, 4:00pm

250 Mathematics Building

Mathematics Department

Colloquium*

Alberto Apostolico

Georgia Institute of Technology & Università di Padova

Computing Surprise

Classical information theory equates information to surprise. This talk examines the computational aspects of finding surprising regularities in sequences of diverse nature.

The problem of modeling and detecting recurrent or rare patterns such as substrings or motifs and related associations or rules is pursued ubiquitously in order to compress data, unveil relationships, infer succinct descriptions, extract and classify features, etc. In molecular biology, special classes of patterns are variously implicated in facets of biological structure and function. And in general, effective pattern discovery tools are becoming increasingly vital in the process of transforming data into insight and knowledge.

This talk proposes a brief account of algorithmic pattern discovery and its applications, and highlights issues, products and challenges emerged in recent and current work.

Professor Apostolico's research interests are in the areas of algorithmic analysis, design and application. Most of his work deals with algorithms and data structures for combinatorial pattern matching and discovery problems as arising in text editing, data compression, picture processing, biomolecular sequence analysis, etc.

He is a co-editor (with Z. Galil) of the seminal volumes *Combinatorial Algorithms on Words* (Springer-Verlag) and *Pattern Matching Algorithms* (Oxford University Press); serves on the editorial boards of *Parallel Processing Letters*, *Theoretical Computer Science*, *Journal of Computational Biology*, *Chaos Theory and Applications*, *International Journal of Bioinformatics Research and Applications*, *International Journal of Foundations of Computer Science*, *The Computer Journal*, *Springer-Verlag Lecture Notes on Bioinformatics*, and has been guest editor of special issues for *Algorithmica*, *Information Sciences*, *Journal of Discrete Algorithms*, *BMC-Bioinformatics*, *PPL*, *JCB*, and *TCS*.

A founding member of the steering committee of the International Symposia on Combinatorial Pattern Matching, the proceedings of which he co-edited in 1993, 1994, 1997, 2002 and 2005, Professor Apostolico also has served on the steering committees of the International Conferences on Discovery Science and the Symposia on String Processing and Information Retrieval. He was founding executive committee member of the Fibonacci Institute for the Foundations of Computer Science and of the MSE Program in Software Engineering. He has served on the program committees of many international conferences, including most recently Research in Computational Biology (RECOMB), Workshop on Algorithms in Bioinformatics (WABI), IEEE Data Compression Conference, String Processing and Information Retrieval (SPIRE) and Combinatorial Pattern Matching (CPM).

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The talk will be accessible to undergraduates.