University at Buffalo
The State University of New York

Department of Computer Science and Engineering

Presents

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Piotr Indyk, Massachusetts Institute of Technology

Sparse Recovery Using Sparse Random Matrices

Over the recent years, a new ***linear*** method for compressing high-dimensional data (e.g., images) has been discovered. For any high-dimensional vector x, its ***sketch*** is equal to Ax, where A is an m x n matrix (possibly chosen at random). Although typically the sketch length m is much smaller than the number of dimensions n, the sketch contains enough information to recover an ***approximation*** to x. At the same time, the linearity of the sketching method is very convenient for many applications, such as data stream computing and compressed sensing.

The major sketching approaches can be classified as either combinatorial (using sparse sketching matrices) or geometric (using dense sketching matrices). They achieve different trade-offs, notably between the compression rate and the running time. Thus, it is desirable to understand the connections between them, with the goal of obtaining the "best of both worlds" solution.

In this talk we show that, in a sense, the combinatorial and geometric approaches are based on different manifestations of the same phenomenon. This connection will enable us to obtain several novel algorithms and constructions, which inherit advantages of sparse matrices, such as lower sketching and recovery times.

Joint work with: Radu Berinde, Anna Gilbert, Howard Karloff, Milan Ruzic and Martin Strauss.

Thursday, October 2, 2008
3:30 - 4:30 PM

Student Union Theater Room 106/201

University at Buffalo – North Campus

This talk is free and open to the public. Refreshments for attendees after the talk in 224 Bell Hall

For more information, please email **cse-dept@cse.buffalo.edu** or contact (716) 645-3180