



香港中文大學
The Chinese University of Hong Kong

Institute of Theoretical Computer Science and Communications

ITCSC-CSE Seminar

Optimality of the Johnson-Lindenstrauss lemma

By

Prof Jelani Nelson

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2:00 pm – 3:00 pm

Room 121, 1/F, Ho Sin Hang Engineering Building, CUHK

Abstract:

Dimensionality reduction in Euclidean space, as attainable by the Johnson-Lindenstrauss lemma, has been a fundamental tool in algorithm design and machine learning. The JL lemma states that any n point subset of ℓ_2 can be mapped to ℓ_2^m with distortion $1+\epsilon$, where $m = O((\log n) / \epsilon^2)$. In this talk, I discuss our recent proof that the JL lemma is optimal, in the sense that for any n, d, ϵ , where ϵ is not too small, there is a point set X in ℓ_2^d such that any $f: X \rightarrow \ell_2^m$ with $1+\epsilon$ distortion must have $m = \Omega(\epsilon^{-2} \log n)$. I will also discuss some subsequent work and future directions.

Joint work with Kasper Green Larhus (Aarhus University).

Biography:

Jelani Nelson is Associate Professor of Computer Science and John L. Loeb Associate Professor of Engineering and Applied Sciences at Harvard University. His research focus is on streaming and sketching algorithms, dimensionality reduction, compressed sensing, and large-scale linear algebra algorithms.

***** ALL ARE WELCOME *****

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