



# Dimensionality Reduction via Sparse Matrices

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This talk will discuss sparse Johnson-Lindenstrauss transforms, i.e. sparse linear maps into much lower dimension which preserve the Euclidean geometry of a set of vectors. Both upper and lower bounds will be presented, as well as applications to certain domains such as numerical linear algebra.

Based on works with Jean Bourgain (IAS), Sjoerd Dirksen (RWTH Aachen), Daniel M. Kane (UCSD), and Nguyễn Lê Huy (Simons Institute).

## Biography

Jelani Nelson grew up in St. Thomas, US Virgin Islands. He obtained his S.B. degrees (2005) in mathematics and computer science, an M.Eng. (2006) in computer science, and a Ph.D. (2011) in computer science, all from MIT. He subsequently spent a semester as a postdoc at the Mathematical Sciences Research Institute, then a year and a half at Princeton University and the Institute for Advanced Study before joining Harvard as an Assistant Professor of Computer Science in 2013. He was a co-winner of the George M. Sprowls Award for best computer science doctoral thesis at MIT, and his work on the distinct elements problem received the best paper award at PODS 2011 and an IBM Research Pat Goldberg Memorial Best Paper Award. He is a recipient of an NSF CAREER award, an ONR Young Investigator Award, and a Google Faculty Research Award. His research interests revolve in the theoretical foundations of big data analysis, with specific focus on streaming, sketching, dimensionality reduction, large-scale linear algebra, and compressed sensing.