1010-68-143 **Kedar Dhamdhere***, Googl. *Improved Embeddings of Graph Metrics into Random spanning trees.*

Over the past decade, numerous algorithms have been developed using the fact that an n-point metric can be probabilistically embedded into trees with $O(\log n)$ distortion. However, when the metric is the shortest-path metric of an edge weighted graph G = (V,E), a natural requirement is to obtain such a result where the support of the distribution is only over subtrees of G. For a long time, the best result satisfying this stronger requirement was a $\exp(\sqrt{\log n \log\log n})$ distortion result of Alon et al. In a recent breakthrough, Elkin et al. improved the distortion to $O(\log^2 n \log\log n)$.

In this talk, we present a construction that improves the distortion to $O(\log^2 n)$, improving slightly on the Elkin et al.'s construction. Our main contribution is in the analysis: we use an algorithm which is similar to the star decomposition by Elkin et al. Using a new probabilistic analysis, we eliminate one of the logarithmic factors. We hope that our ideas (perhaps in conjunction with some of these others) will ultimately lead to an $O(\log n)$ distortion embedding of graph metrics into distributions over their spanning trees (matching the lower bound of $O(\log n)$). (Received August 23, 2005)