

1077-AH-900 **Steven J. Gortler*** (sjg@cs.harvard.edu), 33 oxford st., cambridge, MA 02138. *Graphs, Distances, and Semidefinite Programming.*

In this talk I will discuss the difficult problem of determining the position of a set of points in space (up to an unknowable Euclidean transform) given the pair-wise distances between some of the pairs of points. This problem arises in sensor network localization and molecular shape determination. (It is also related to the problem of reconstructing a low rank matrix given a subset of its entries.) The most powerful algorithms for this problem are based on semidefinite programming. The main tool we will focus on is something called an equilibrium stress matrix. It turns out that this matrix can tell us when the problem is well posed (has a unique solution), and also when we can expect semi-definite programming techniques to succeed for such a problem.

This talk will cover joint work with Alex Healy, Dylan Thurston and Yuanchen Zhu. (Received September 14, 2011)