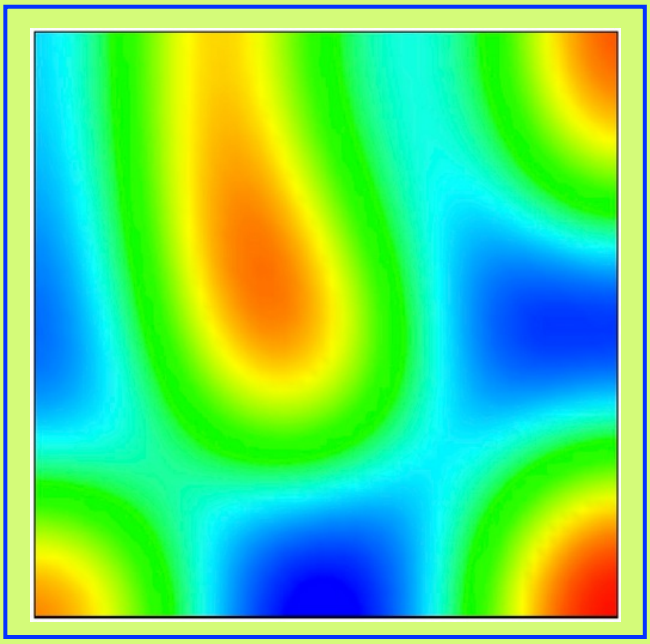
UCCS Department of Mathematics

MATH COLLOQUIUM SERIES

DR. SEAN O'ROURKE
CU BOULDER



DATE:
SEPTEMBER 17, 2015

TIME:
12:30PM-1:30PM
(REFRESHMENTS AT 12:15PM)

LOCATION:
UNIVERSITY CENTER
ROOM# 122

Singular Values and Vectors Under Random Perturbation

Abstract: Computing the singular values and singular vectors of a large matrix is a basic task in high dimensional data analysis with many applications in computer science and statistics. In practice, however, data is often perturbed by noise. A natural question is the following. How much does a small perturbation to the matrix change the singular values and vectors?

Classical (deterministic) theorems, such as those by Davis-Kahan, Wedin, and Weyl, give tight estimates for the worst-case scenario. In this talk, I will consider the case when the perturbation is random. In this setting, better estimates can be achieved when our matrix has low rank. As an application, I will discuss several matrix reconstruction problems including a Netflix-type problem. This talk is based on joint work with Van Vu and Ke Wang.