UNIVERSITY OF CALIFORNIA
RIVERSIDE

DEPARTMENT OF MATHEMATICS

SPECIAL SEMINAR

DR. GILBERT STRANG
MIT

"MULTIPLYING AND FACTORING MATRICES"

To compute AB, the first choice is rows of A times columns of B. But to understand AB, I believe that adding outer products (columns of A times rows of B) is the best! I hope to show how 5 great factorizations are naturally described this way—as a sum of rank one matrices.

$$A = LU \quad A = QR \quad S = Q\Lambda Q^T \quad A = X\Lambda Y^T \quad A = U\Sigma V^T$$

Those come from elimination and Gram-Schmidt and eigenvalues and singular values: **lu**, **qr**, **eig**, and **svd**. In the process I would like to discuss the teaching of linear algebra.

WEDNESDAY, FEBRUARY 1ST, 2017
SURGE 284
2:10 - 3:00 P.M.

UNIVERSITY OF CALIFORNIA
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DEPARTMENT OF MATHEMATICS

COLLOQUIUM

DR. GILBERT STRANG
MIT

"SINGULAR VALUES OF MATRICES AND DATA SCIENCE"

The "fundamental theorem of linear algebra" tells us about orthogonal bases for the row space and column space of any matrix. More than that, it identifies the most important part of the matrix -- which is a central goal for a matrix of data. This talk will be partly about the underlying theory -- the Singular Value Decomposition -- and partly about some of its applications to data science and signal and image compression.

WEDNESDAY, FEBRUARY 1st, 2017
SURGE 284
TEA TIME 3:40 P.M.
TALK BEGINS 4:10 P.M.