1023-J1-180 **Michael Huber*** (huber@muhlenberg.edu), Department of Mathematical Sciences, 2400 Chew Street, Allentown, PA 18104. *Optimizing Singular Values for Images.* Preliminary report.

I will discuss an undergraduate linear algebra project which combined image compression and the singular value decomposition, illustrating it with low-rank approximations of a picture. An image is just an matrix, where entry (i, j) is interpreted as the brightness of pixel (i, j). In other words, matrix entries ranging from 0 to 255 are interpreted as pixels ranging from black through various shades of gray to white. Students converted color images into black and white images and then into matrices; they then compressed the image by storing many fewer numbers, from which they could still approximately reconstruct the original image. After performing the SVD on a chosen image, students had to determine the optimum number of singular values needed to reconstruct the image while trying to save memory. The procedure was repeated for a photo-mosaic image, which was converted into a block matrix. Students ran the SVD program and tried to determine the optimum number of singular values needed to recreate each image, comparing the block image to the separate images. The Mathematica code used for the project, as well as student work and feedback, will be demonstrated. (Received August 21, 2006)