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Roland Minton* (minton@roanoke.edu), 620 Beech Road, Salem, VA 24153. *Image Processing With Mathematica.*

This demonstration uses Mathematica to construct and display Fourier and wavelet approximations of digital photographs. A surprising amount of information is available using a small number of terms. Even with a large number of terms, the persistence of the Gibbs phenomenon is problematic. The Gibbs phenomenon is manifested as a "ghost" outline of a dark edge and can be very dramatic. Modifications to Fourier series can remove the Gibbs phenomenon, but at the expense of a significantly slower convergence rate. A simple Haar wavelet approximation is easy to implement, but illustrates the localization property of wavelets that make them superior to Fourier approximations. (Received August 10, 2005)