1067-L1-1523 **Thomas W Polaski*** (polaskit@winthrop.edu), Department of Mathematics, Winthrop University, Rock Hill, SC 29733. *Visualizing Discrete Dynamical Systems.*

Discrete dynamical systems of the form $\mathbf{x}_{k+1} = A\mathbf{x}_k$ are often encountered in the first undergraduate linear algebra course and are used in models from ecology and engineering. The eigenvalues and eigenvectors of A are the key to understanding the long-term behavior of these systems. When A is a 2×2 matrix, one can gain geometric information about the dynamical system by plotting a trajectory, which is an initial point $\mathbf{x}_0$ together with its iterates $\mathbf{x}_1, \mathbf{x}_2, \ldots$. This talk will demonstrate programs in *Mathematica* that allow students to create a matrix A with their choice of real or complex eigenvalues and to animate trajectories of the resulting dynamical system from multiple initial points. The programs also allow students to work with a matrix with randomly chosen eigenvectors so as to discover the importance of the directions of the eigenvectors when the eigenvalues of A are real. (Received September 21, 2010)