

1035-M1-1553 **Jonathan R Senning*** (jonathan.senning@gordon.edu), Department of Mathematics and Computer Sci, Gordon College, 255 Grapevine Road, Wenham, MA 01984. *Homogeneous Coordinates: They work, but where do they come from?*

Computer graphics provides a popular application of linear transformations in introductory linear algebra courses when homogeneous coordinates are used to permit translation to be implemented as a linear transformation. The justification for this is frequently that "it works." While this may be acceptable when they are first introduced, once students have been exposed to bases and isomorphisms they have all the necessary background to not only see where homogeneous coordinates come from and why they work, but other useful transformations that their use makes possible. I will discuss affine spaces, describe how homogeneous coordinates are the coordinates of "frames" and, time permitting, show how they are used in perspective projections. (Received September 20, 2007)