Abstract Submitted
for the MAR16 Meeting of
The American Physical Society

Statistical Modeling of Robotic Random Walks on Different Terrain AUSTIN NAYLOR, LAURA KINNAMAN[1], Morningside College — Issues of public safety, especially with crowd dynamics and pedestrian movement, have been modeled by physicists using methods from statistical mechanics over the last few years. Complex decision making of humans moving on different terrains can be modeled using random walks (RW) and correlated random walks (CRW). The effect of different terrains, such as a constant increasing slope, on RW and CRW was explored. LEGO robots were programmed to make RW and CRW with uniform step sizes. Level ground tests demonstrated that the robots had the expected step size distribution and correlation angles (for CRW). The mean square displacement was calculated for each RW and CRW on different terrains and matched expected trends. The step size distribution was determined to change based on the terrain; theoretical predictions for the step size distribution were made for various simple terrains.

[1]It's Dr. Laura Kinnaman, not sure where to put the Prefix.

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Date submitted: 05 Nov 2015 Electronic form version 1.4