Engineering Maxwell's Demon[1] ZHIYUE LU, University of Maryland at College Park, DIBYENDU MANDAL, UC Berkeley, CHRISTOPHER JARZYN-SKI, University of Maryland at College Park — We describe a hypothetical machine, with moving, mechanical components, that acts as an autonomous Maxwell's demon. The machine operates in two useful modes. It can act as an *information engine* by rectifying the thermal motions of surrounding gas particles to lift a mass against gravity, while writing information to a stream of bits. Alternatively, it can act as an *eraser*, harnessing the energy of a falling mass to erase information from a stream of bits. We solve for the phase diagram and compute the efficiency of our model, both analytically and numerically. Our model provides a simple example of a mechanical machine that is driven by the information entropy of a stream of bits, rather than a difference in temperatures or chemical potentials.

Zhiyue Lu
University of Maryland at College Park