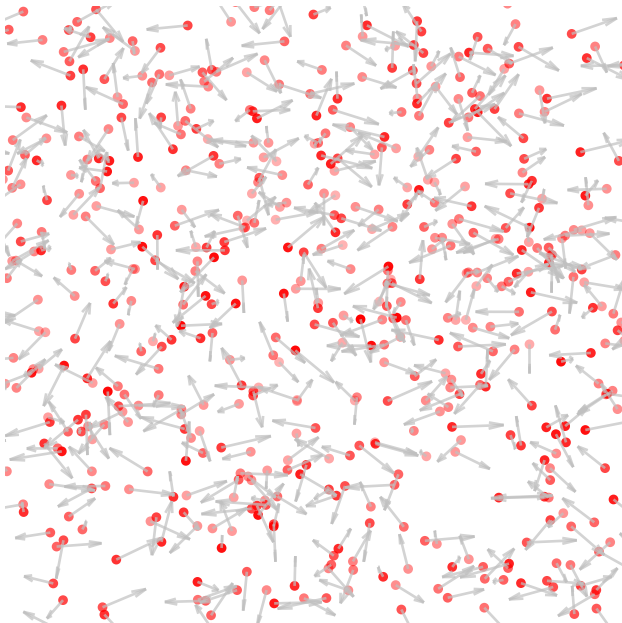Original $(\mathbf{r_i}, \mathbf{v_i})$ Transformed $(\mathbf{r'_i}, \mathbf{v'_i})$