Washington Experimental Mathematics Lab
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Random Inelastic Billiards

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Github:
https://github.com/jzariski/Random-Inelastic-Billiards.git

Sticky Particle Dynamics

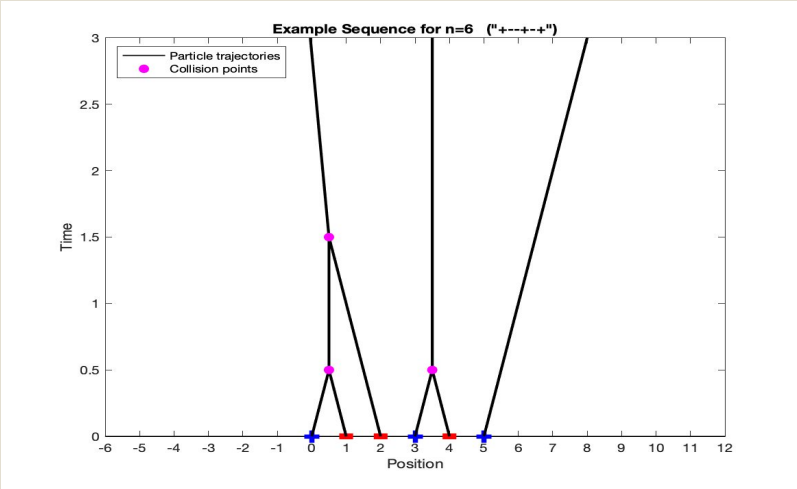
Motivation:

- Begin with *n* equally spaced particles with equal mass.
- Assign each particle a velocity of either +1 or -1 units.
- Explore the system as time evolves, considering each collision inelastic with adherence to the principle of conservation of momentum.

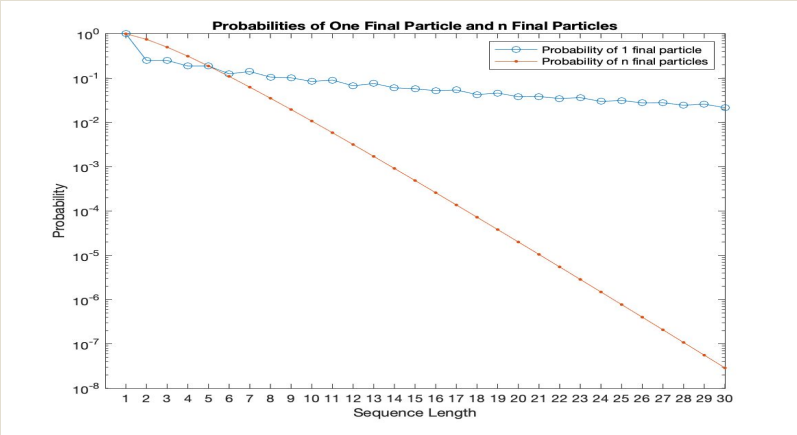
Methods:

- **"Small" values of n:** Able to derive final state of the system by hand. We define small as being in the single digits.
- **Large values of n:** Created a python script to handle larger sizes. Utilized cluster computing.

Example Diagram and Computational Results



- This example system begins with 6 particles of unit mass and +1 or -1 unit velocity. As time is taken to infinity, multiple collisions occur, such that the final system contains only three final particles.



- Final results for probabilities of one final particle remaining and *n* final particles remaining, given a random *n*-length system of billiards.