

On the collapse of the system-wide nearest-neighbour edge length histogram

S. Halayka *

March 19, 2020

Abstract

The collapse of the system-wide nearest-neighbour edge length histogram is considered.

1 Collapse of the histogram

See

<https://motls.blogspot.com/2009/04/perceiving-randomness-egalitarian-bias.html>
for an introduction into Ludolph and Coulomb systems.

*sjhalayka@gmail.com

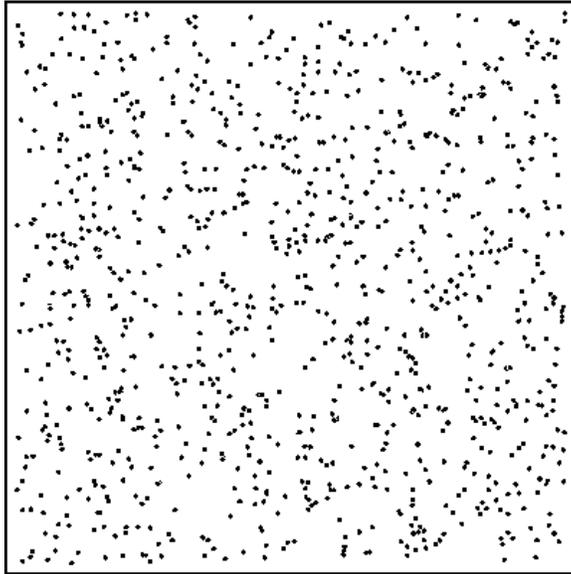


Figure 1: A bounded Ludolph system where the vertices are placed pseudorandomly along a 2-plane. The nearest-neighbour edges are not shown.

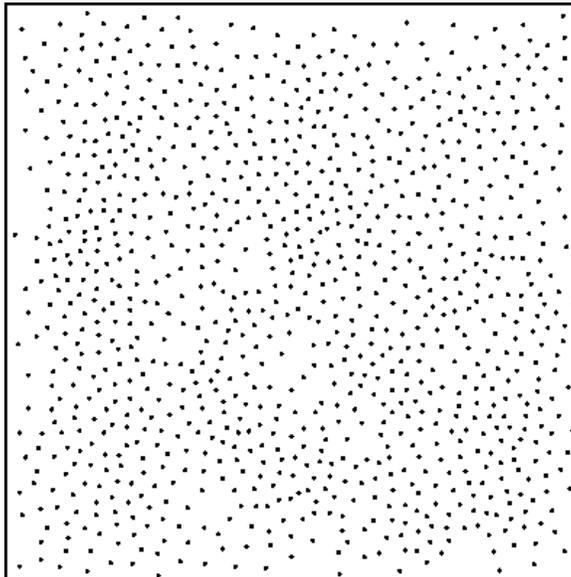


Figure 2: A bounded Coulomb system where the vertices are repulsive, along a 2-plane. The nearest-neighbour edges are not shown.

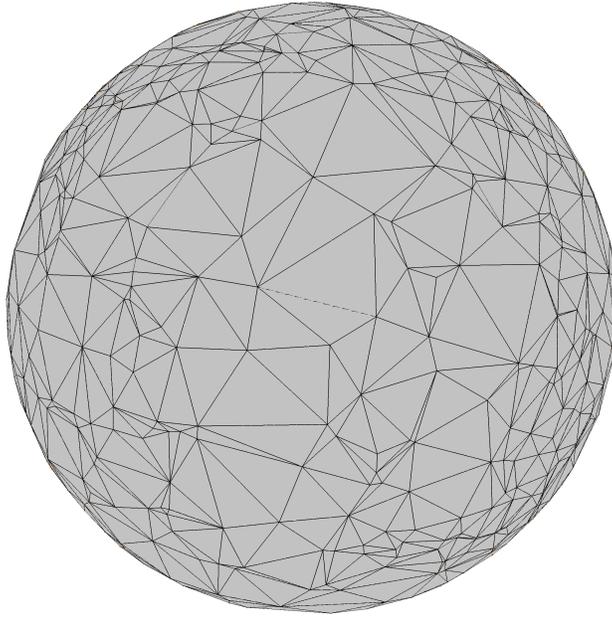


Figure 3: An unbounded Ludolph system where 1000 vertices are placed pseudorandomly along a 2-sphere. The tessellated 2-sphere is unbounded because it is a boundary in and of itself.

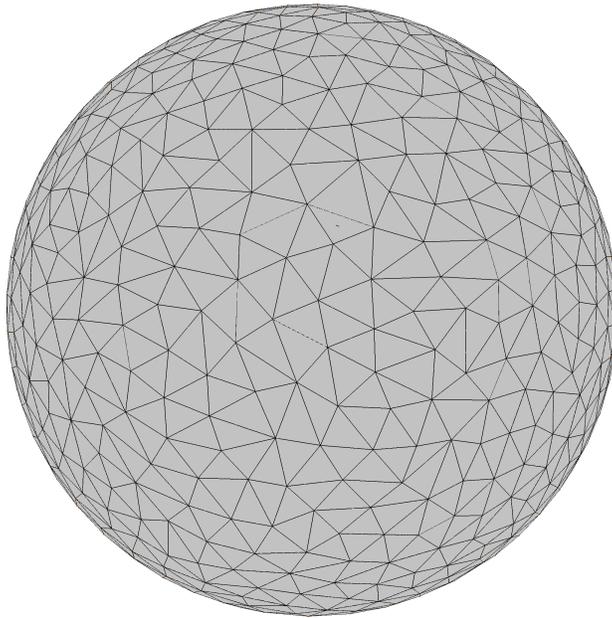


Figure 4: An unbounded Coulomb system where the 1000 vertices are repulsive, along a 2-sphere. The number of repulsion rounds is 1000.

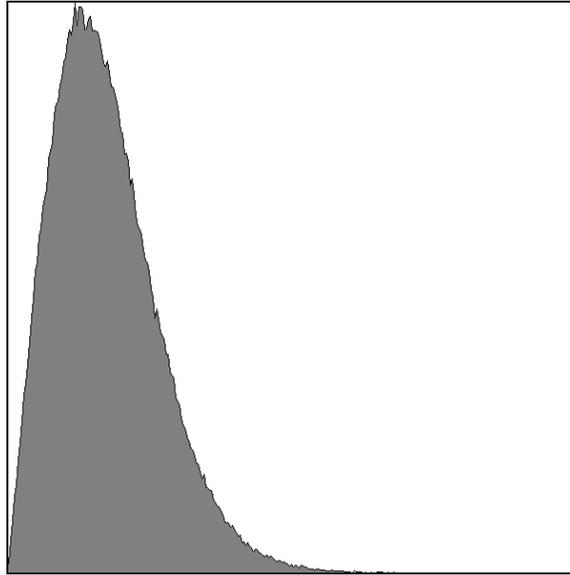


Figure 5: A system-wide nearest-neighbour triangle edge length histogram for 100,000 pseudorandomly placed vertices along a 2-sphere. Note that the edge length histogram has formed a broad spectrum.

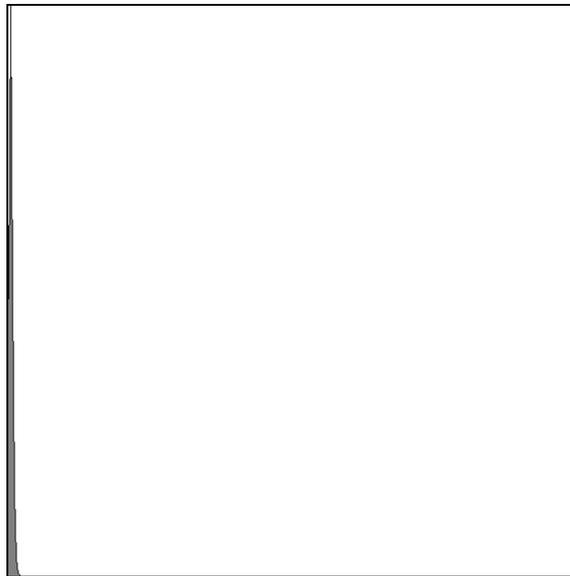


Figure 6: A system-wide nearest-neighbour triangle edge length histogram for 100,000 repulsive vertices along a 2-sphere. The tessellated 2-sphere represents an unbounded Coulomb system, where the number of repulsion rounds is 100. Note that the edge length histogram has collapsed into a very thin, monochromatic spike. This is because the edge lengths have become as regular as possible.