

Clustering Nodes

Simulation Plots of Clustered Nodes

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July 10, 2017

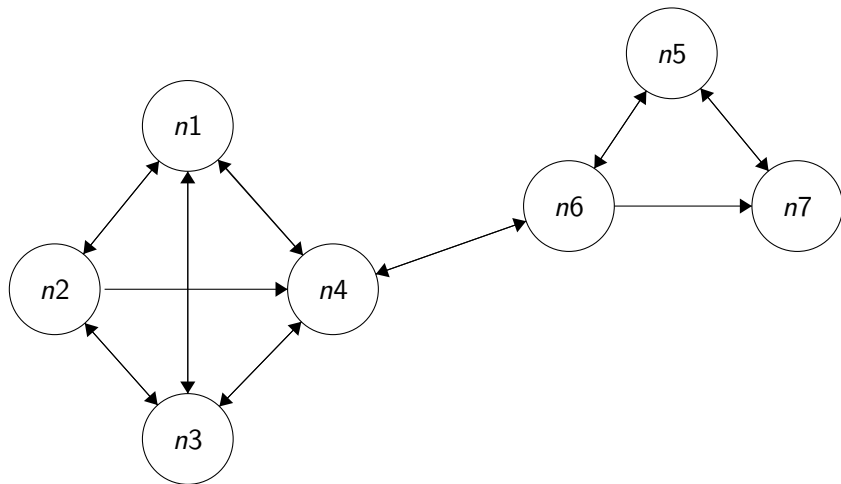
Outline

- 1 Objective
- 2 Simulation Plots
- 3 Proposed Methods

Objective

- For a given graph with nodes and edges, we define certain constraints
 - All nodes repel each other.
 - The nodes connected to each other through an edge have attractive forces.
 - All motions are opposed by a constant frictional force.
- Simulate the motion of these nodes.

Graph Example



Simulation Plots

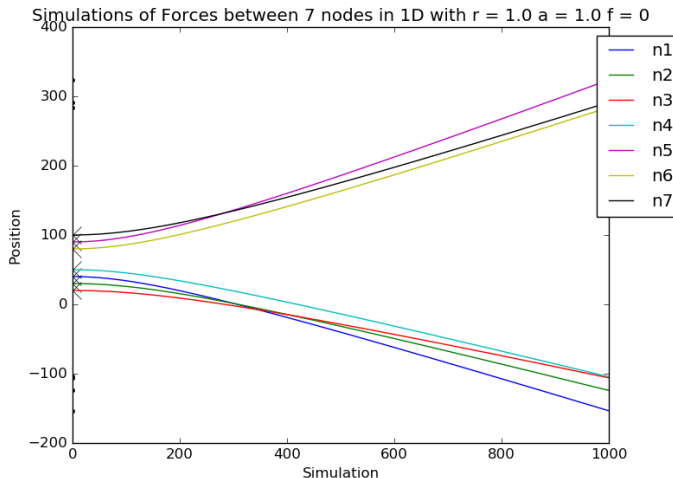


Figure: Simulation of motion of Nodes in 1D

Simulation Plots

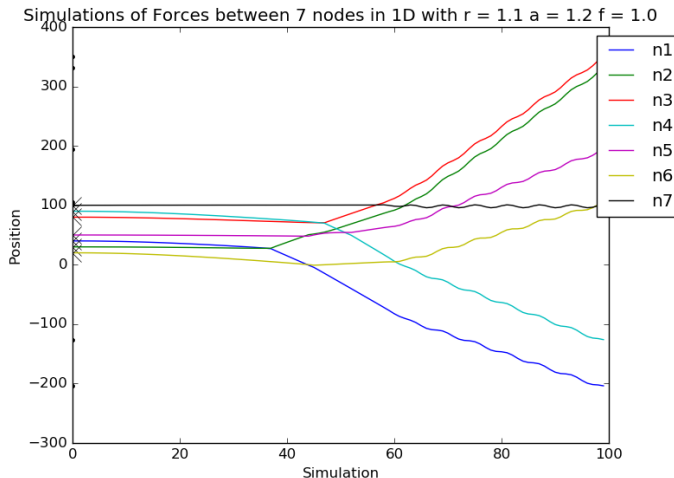


Figure: Simulation of motion of Nodes in 1D

Simulation Plots

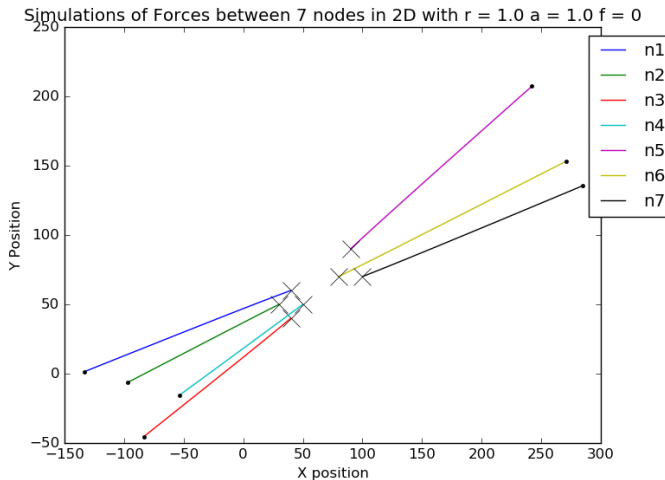


Figure: Simulation of motion of Nodes in 2D

Challenged Faced

- As you can see in [6], the cluster (n1,n2,n3,n4) is being split into two because of the presence of another cluster (n5,n6,n7) in the middle. Retaining original clusters is preferable.
- Representation in higher dimension is slightly problematic.
- There are certain bugs in the code.

Proposed Methods

- Change the laws of attraction & repulsion i.e instead of inverse of distance squared, we can try with distance squared, this might make further objects come together while not alienating the nearby objects.
- Represent distance from origin for each node instead of the position in space. (Might reduce information!!)
- (Generalise) Give an edge weight between nodes which can indicate the degree to which they are attracted.