APSC 200 P2: Week 4 Outline

Department of Mathematics and Engineering
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1 Objectives

The general objectives for this week are

1. to complete developing basic functionality of your simulation app (with the exception of Lloyd's Algorithm),
2. to continue documenting your design process in preparation for the final report by
   (a) finalizing design criteria/metrics on which to evaluate potential design solutions, and
   (b) to continue Triple Bottom Line analyses.

1.1 Formation Algorithm

1. Write code for the *moveAgents.m* function whose dynamics are governed by the Laplacian matrix.
2. Research parameters related to application that would be used in potential cost or energy functions to be implemented with the *moveAgents.m* function.

1.2 Flocking Algorithm

1. Write code for the *calcLeaderVelocity.m* function that calculates the leaders velocity for each iteration of the simulation.
2. Write code for the *trigger.m* function to include a trigger sequence that decides if the leader velocity should be updated to the trajectory velocity.
3. Write code for the *updateVelocity.m* function that uses the flocking's position update equation to update the velocity of each agent for every iteration of the simulation.
4. Research parameters related to application that would be used in potential cost or energy functions to be implemented with the *updateVelocity.m* function.

1.3 Opinion Algorithm

1. Write code for the *updateNodeData.m* function that uses the opinion dynamics algorithm's position update equation to update the agent position. Should be able performs calculations for 1-dimensional or 2-dimensional cases.
2. Research parameters related to application that would be used in potential cost or energy functions to be implemented with the *updateNodeData.m* function.

1.4 Lloyd's Algorithm

1. Complete the *calcDensity.m* function to translate density function(s) to a discrete density matrix for the given iteration.
2. Complete the *calcMass.m* function to compute the mass of each agent's observed region.
3. Complete the *calcCentroids.m* function to calculate the centroid of each agent's observed region.

2 Lectures and Workshops

There are two workshops scheduled for this week. During these times, you are to work on the above tasks and ask TAs any questions you may have about your project.

3 Deliverables

There are no deliverables due this week.