APSC 200 P2: Week 4 Outline

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1 Objectives

The main objectives of this week are listed below.

1. Continue translating mathematics derived for application into MATLAB code to be used in simulation apps. By the end of this week, the corresponding simulation app for each deployment method should be able to function effectively with simple entries and no cost functions introduced. Refer to APSC 200 P2: Course Manual for more information on each deployment methods algorithm
2. Design Process
   (a) Establish metrics to evaluate design choices
   (b) TBL Analysis for application area
   (c) Begin Research into Economic Analysis for application

1.1 Formation Algorithm

1. Write code for the *moveAgents.m* function that uses the formation algorithm's position update equation to update the agent position.
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* for a trigger sequence that decides if the leader velocity should be updated to the trajectory velocity.
3. Write code for the *UpdateVelociy.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 to 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 is one lecture and two workshops scheduled for this week. This weeks lecture is second of two lectures teaching skills that will be required to effectively translate the deployment algorithms into MATLAB code. The two workshops are work periods to work on your project and an opportunity to ask the TAs questions you may have about the project.

3 Deliverables

There are no deliverables due this week.