APSC 200 P2: Week 3 Outline

Department of Mathematics and Engineering
Queen's University

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1 Objectives

The general objectives for this week are

1. to begin translating mathematics from Week 2 into MATLAB code, and
2. to continue documenting your design process in preparation for the final report by
   (a) establishing metrics to evaluate design choices, and
   (b) beginning Triple Bottom Line analyses for your project.

1.1 Formation Algorithm

1. Implement the adjacency matrix formulas derived in Week 2 in the *calcA.m* function.
2. Write code for the *calcL.m* function that calculates the Laplacian Matrix given the adjacency matrix.

1.2 Flocking Algorithm

1. Use *MatrixEditorFlocking* app to enter leader path, parameters, and initial agent data derived in Week 2.
2. Write code for the *calcA.m* function that calculates the adjacency matrix design parameters used for the algorithm and the current distance between agents.
3. Write code for the *calcL.m* function that calculates the Laplacian matrix given some adjacency matrix.

1.3 Opinion Algorithm

1. Use *MatrixEditorOpinion* app to enter initial node data derived in Week 2.
2. Write code for the *calcA.m* function that calculates the adjacency matrix using the radius of communication and the distance between nodes.
3. Write code for the *calcL.m* function that calculates the Laplacian matrix given some adjacency matrix.

1.4 Lloyd's Algorithm

1. Use *MatrixEditorLloyd* app to input density. functions/matrices constructed in Week 2 and initial agent positions
2. Write code for the *communication.m* function to determine which agents are in communication.
3. Write code for the *assignAgentPoints.m* function to determine the observed region of each agent.

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

This weeks deliverables are

1. Progress Report 1.