BRADLEY UNIVERSITY
Electrical and Computer Engineering
ECE443/543 — HW 1

Problem 1: Conduct a literature search on multiagent systems applications. Give two examples and describe cooperative control applications in multiagent systems.

Problem 2: The typical Vicsek model for 2D particle motion is given by

$$\theta_i(k+1) = \frac{1}{1+n_i(k)}\left(\theta_i(k) + \sum_{j\in\mathcal{N}_i(k)} \theta_j(k)\right) \quad (1)$$

$$x_i(k+1) = x_i(k) + V\cos(\theta_i(k)) \quad (2)$$

$$y_i(k+1) = y_i(k) + V\sin(\theta_i(k)) \quad (3)$$

where $[x_i(k), y_i(k)]^T$ is the position vector of the ith particle at the time instant k, $\theta_i(k)$ its heading. Write a simulation program to implement this algorithm. Plot the results and explain your findings.