CS 286 - Homework 1, Question 1

Adolfo Roquero, Leticia Schettino, Kobi Greene

February 2022

1) e) Using ideas from "Networked Robots," by Kumar, Rus, and Sukhatme, consider how this simulation might translate to the real world. In a scenario with very limited sensing radii, what advantages does networking provide on top of sensing?

One of the advantages that network provides on top of sensing, especially in a situation where the sensing radii is limited, is that the sensor network extends the effective sensing range of the robots. This is because even if a robot can only sense in a very small range, it could communicate with a robot distant from it and send and receive data on each other's sensors, which leads to a better understanding of the environment and state of each robot in the network. Furthermore, the robot control architecture is still decentralized and can take advantage of the robustness from having this type of architecture. If we consider our simulation for instance, in problem 1)b) we have quite a limiting scenario where we only allow robots to communicate with other robots within their sensing range. The advantage of having decentralized communication in that way is that it does not overload the communication bandwidth. However, this communication architecture makes communication between distant robots quite challenging and global convergence towards a position more time consuming. If the robots are networked, however, they can communicate over the network, across long distances, which simplifies coordination between robots.