Weekly report

1. **My *Goals* from last week**

* Determine which heuristics can be implemented quickly
* Prepare report on internship
* Determine goal for the non-overlapping particles.

1. **My *Accomplishments* this week**

* Completed a study on the segmentation methodology followed in matlab and initiated pipeline for segmentation.
* Of the 3 heuristics- collect based on size, collect based on proximity, collect based on path freeness, the collect based on size and collect based on path freeness have to be modeled more intensively than the one based on proximity. Biggest hurdle is to keep an updated list of all the swarms in the workspace. Also configuration space has to be defined in the case of moving using path size.

The pseudo algorithm is as follows for the 3 are as follows:

A)Proximity:

1. Set centroid of goal ROI as root node of the tree.
2. Search using BFS on the nearest particle.
3. Implement move sequence and as particle touches ROI, the particle is deleted and so is the space.
4. Check area of the ROI, Algorithm ends if area(ROI) =0; else go to step 1.

B) Path freeness:

1) Assign weights to each free space. Weights given based on connectivity to obstacles. Increment by 1 for each space occupied around pixel. Pixel gets 8 if completely surrounded by obstacles and 0 if all pixels free around it.

2) BFS to centroid of ROI with priority on the free path pixels.

3) Check if particles lie along the freest path. If true, collect those particles.

4) Continue until area (ROI)=0; Else return to 3.

C) Size of cluster:

1) Create list of bwlable on particles and mark the cluster with biggest size.

2) Implement BFS from centroid of largest cluster to the centroid of ROI.

3) Repeat until area(ROI)=0; Else return to 2.

* Learnt a lot of image processing techniques in MATLAB and algorithmic robotic concepts including- opening and closing of images, watershed segmentation, erosion of matrices, dialation of matrices, quick computation methods to implement blob analysis, contouring in MATLAB and in Algorithmic robotics-Structuring an algorithm, defining the robustness check, determining error condition, random sampling, defining and working on C-spaces, collision check and compute the order of complexity(BIG O) for algorithms.

1. **My *Goals* for next week**

* Complete the basic structuring of the proximity heuristic.
* Determine how to tackle the listing of clusters.

1. **What I need Dr. Becker to do:**

* Check and alter the heuristics mentioned above.
* Help with debugging the code which I will submit on Monday.