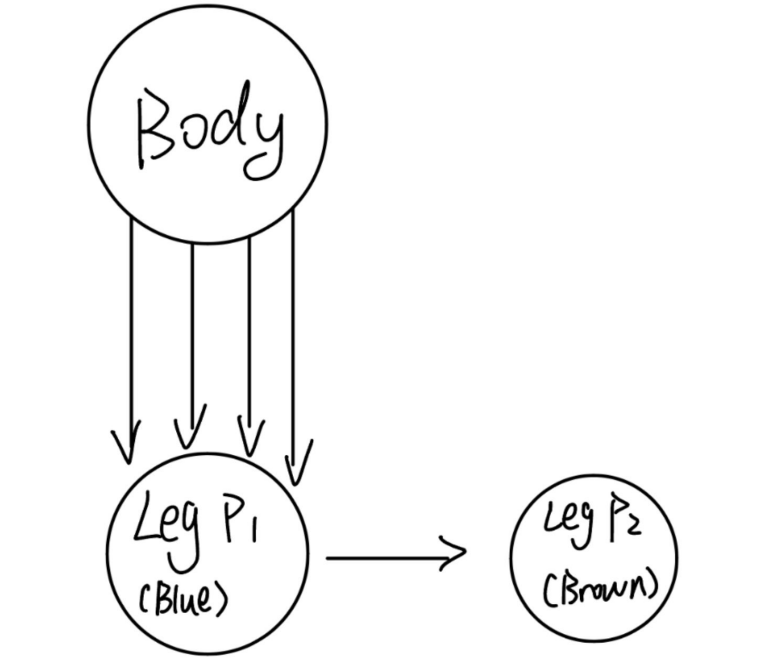
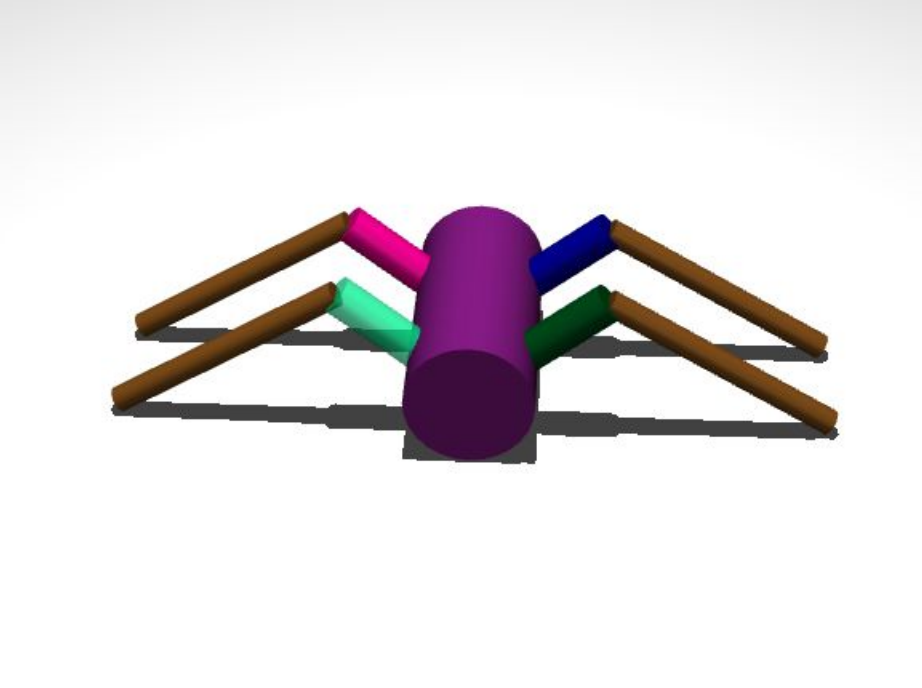
Final Project

Yao Xiao

Original Creature





Initial Randomization → Population

Randomize main body shape, size

Randomize legs shape, size

Fitness Function:

Efficiency of the movement:

Absolute Dist(start to end) / Total Dist Moved

Mutation Functions

- MutateWeightMass: Add a weightmass of random mass deviated from the center of the main body
- MutateExtendShank: Extend two shank parts on the same side with random coefficient
- MutateMass: Modify the mass of the mainbody evenly to a random value
- MutateTail: Add a tail with random mass and random angle range of the hinge to the mainbody

Evolution

Randomly generate 10 creatures

Select the one with the highest fitness score

Make 10 copies of the best creature

5 rounds of evolution:

1~2: Evolve randomly with two of the mutations

3~5: Evolve randomly with all kinds of mutations

Select the best creature each round for the next population for evolution

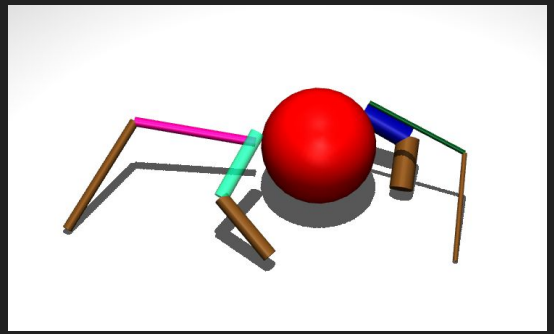
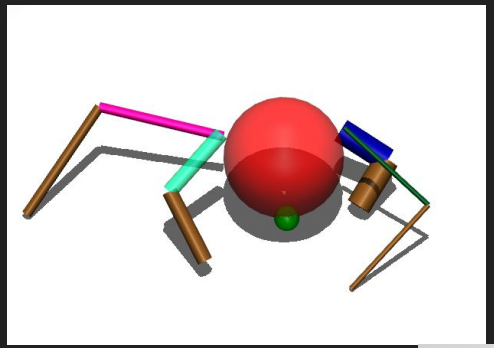
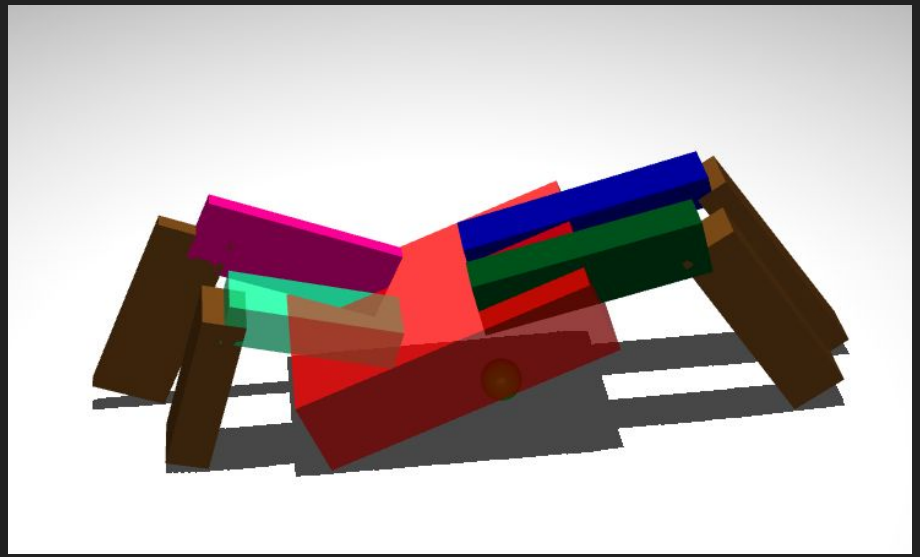
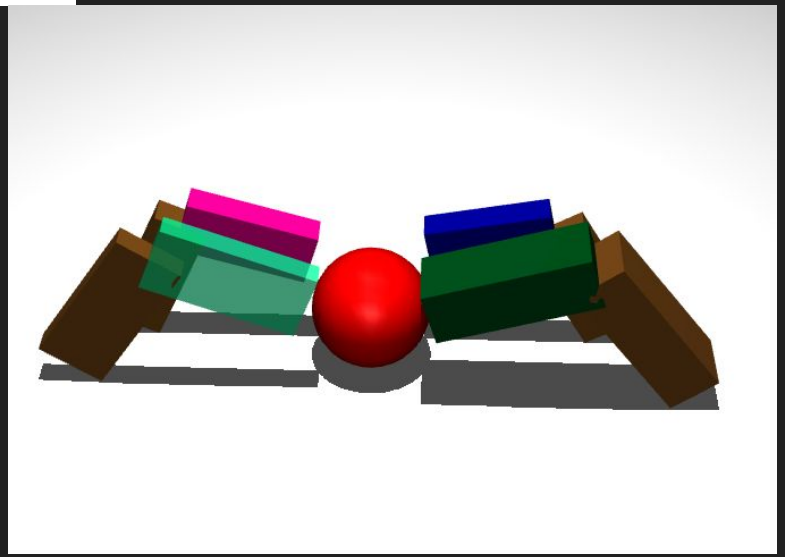
Fitness Score

round 0: 0.4154390595889895

round 1: 0.5730088065771464

round 2: 0.5789245242045443

round 3: 0.5703737766339946

round 4: 0.5545109347093014

round 5: 0.4856392919971018