**IT-326: Introduction to Artificial Intelligence – Angry Birds**

**Week 3 –Submission**

**Team : Finishers**

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**VISUAL RECOGNITION OF THE STRUCTURE:**

Here is the implementation of the method in the code that returns a matrix which keeps note of information of all the blocks in the structure:

* Matrix[block id][0] has the block material and
* Matrix[block id][1] has the block shape.

public String[][] visualize(Vision v){

List<ABObject> blocks = v.findBlocksMBR();

//for(ABObject b : blocks)

// System.out.println(b.id);

ABObject block;

String[][] matrix=new String[blocks.size()][2];

for(int i=0;i<blocks.size();i++){

block=blocks.get(i);

if(block.getType().id==10) {

matrix[block.id][0]="Ice";

matrix[block.id][1]=String.valueOf(block.shape);

}

if(block.getType().id==11) {

matrix[block.id][0]="Wood";

matrix[block.id][1]=String.valueOf(block.shape);

}

if(block.getType().id==12) {

matrix[block.id][0]="Stone";

matrix[block.id][1]=String.valueOf(block.shape);

}

}

for (int i = 0; i <blocks.size() ; i++) {

block=blocks.get(i);

System.out.println(block.id+" "+matrix[block.id][0]+" "+matrix[block.id][1]);

}

return matrix;

}

**GENERAL OUTLINE OF THE STRATEGY:**

Here is our strategy with few revisions made from the previous.

* Instead of hitting one pig at a time and then go for the other, we thought of making use of interconnectedness of the structure. I.e. making use of appropriate types of birds, trajectories to hit at different points in the structure.

In some levels if we keep on trying to hit the pigs without considering the surrounding environment, it fetches less points than what can be achieved if we can successfully exploit the weak spots in the environment

* Try to find the weak points in the structure which will be useful to complete any particular level soon. We will be trying to target the block sitting below the pigs, as it can be used to undermine the structure supporting the pigs.  
  We will be trying to target the block sitting below the pigs, as it can be used to undermine the structure supporting the pigs.
* Make use of the center of mass/center of gravity of each object for maximum destruction.
* Learning from the previous failed attempt in any level and trying to change the trajectories by noting down the previous.
* Hit at the center of mass of objects present near by the pig (+ or – 10 deg) in the case where pig is not directly available to hit.
* Learning the correct usage of various types of birds according to their properties.For example a yellow bird can be best used with minimum angle and maximum velocity to hit the nearby objects, in the case where pig is not freely available to hit.
* Creating a **utility function** for some angles chosen wisely from say (theta1,theta2 , theta3……) and estimate the respective utility value for compulsory-hit (f1) in range(20,30) ,maximum destruction (f3)in range(30,80) and hit the center of mass of all the all objects excluding pigs that has direct trajectory to pigs(+5 of -5 deg difference)(f3) in range(40,80),weak point trajectory(f4)(50).
* U (angle) =f1 (angle) +f2 (angle) +f3 (angle) +f4 (angle)

Then get the appropriate angle x.

We also change the Utility range values absorbing the previous results.

x=max (U (theta1), U (theta2), U (theta3) …….)

if its first shot then use value of x and choose angle theta if there are 1:1 ratio of pigs and birds then change the strategy to Naive approach Strategy if they are side by side the follow the Above Utility strategy.