Week 9 Lab – 3806ICT

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TASK 4 – USV AT (3, 5) AND SURVIVORS AT (3, 2)

By setting it to BFS the minimum number of moves is ten. In this it covers all nine squares and returns home the fastest.

```
51  var pos[2][2]:{0..5} = [0,0,
52                          3,5];
53
54  // The position of survivors in the format
55  var posSurvivor[2]:{0..5} = [3,2];
56
57  // Whether rescue signal is sent.
58  var rescueSignalSent:{0..1} = 0;
59  // Whether the hostile USV is within range
60  var hostileContact:{0..1} = 0;
61
62  // The battery level of the AUV.
```

Output

********Verification Result********
The Assertion (Goal() reaches goalOverall) is **VALID**.
The following trace leads to a state where the condition is satisfied.
<init -> movedown -> movedown -> moveup -> moveright -> movedown -> moveright -> moveup -> moveup -> moveleft -> moveleft>

********Verification Setting********
Admissible Behavior: All
Search Engine: Shortest Witness Trace using Breadth First Search
System Abstraction: False

********Verification Statistics********
Visited States:2763
Total Transitions:6934
Time Used:0.2222212s
Estimated Memory Used:13372.76KB

Event Trace

Src State	Event	Tgt State
0	init	1
1	movedown	2
2	movedown	3
3	moveup	4
4	moveright	5
5	movedown	6
6	moveright	7
7	moveup	8
8	moveup	9
9	moveleft	10
10	moveleft	11

USV AT (3, 5) AND SURVIVORS AT (1, 2)

shows it goes out, finds the survivor and returns to base.

```
16    var world[NoOfRows][NoOfCols]:{Unvisited..V
17
18    // Initial positions of the AUV and USV.
19    // pos[0] is for AUV, pos[1] is for USV.
50    // For each vehicle, [0] is the index of th
51    var pos[2][2]:{0..5} = [0,0,
52                            3,5];
53
54    // The position of survivors in the format
55    var posSurvivor[2]:{0..5} = [1,2];
56
57    // Whether rescue signal is sent.
58    var rescueSignalSent:{0..1} = 0;
59    // Whether the hostile USV is within range
50    var hostileContact:{0..1} = 0;
51
52    // The battery level of the AUV.
```

Options

Admissible Behavior	All
Verification Engine	Shortest Witness Trace using Breadth First Search

Output

********Verification Result********
The Assertion (Goal() reaches goalOverall) is **VALID**.
The following trace leads to a state where the condition is satisfied.
<init -> movedown -> moveright -> moveright -> auvrescue -> moveup -> moveleft -> moveleft>

********Verification Setting********
Admissible Behavior: All
Search Engine: Shortest Witness Trace using Breadth First Search
System Abstraction: False

********Verification Statistics********
Visited States:1904
Total Transitions:3125
Time Used:0.1064657s
Estimated Memory Used:14963.656KB

Event Trace

Src State	Event	Tgt State
0	init	1
1	movedown	2
2	moveright	3
3	moveright	4
4	auvrescue	5
5	moveup	6
6	moveleft	7
7	moveleft	8

USVHOSTILE = (4, 3) AND SURVIVOR = (3, 2)

It goes out, contacts the USV and returns to base in seven moves.

```
// For each vehicle, [0] is the index of th
var pos[2][2]:{0..5} = [0,0,
                        4,3];

// The position of survivors in the format
var posSurvivor[2]:{0..5} = [3,2];

// Whether rescue signal is sent.
var rescueSignalSent:{0..1} = 0;
// Whether the hostile USV is within range
var hostileContact:{0..1} = 0;

// The battery level of the AUV.
```

Verification Engine   Shortest Witness Trace using Breadth First Search   ⌄ Ge

Output

********Verification Result********
The Assertion (Goal() reaches goalOverall) is **VALID**.
The following trace leads to a state where the condition is satisfied.
<init -> movedown -> movedown -> moveright -> auvcontact -> moveup -> moveup -> moveleft>

********Verification Setting********
Admissible Behavior: All
Search Engine: Shortest Witness Trace using Breadth First Search
System Abstraction: False

********Verification Statistics********
Visited States:1074
Total Transitions:1646
Time Used:0.0718759s
Estimated Memory Used:11919.688KB

Event Trace

Src State	Event	Tgt State
0	init	1
1	movedown	2
2	movedown	3
3	moveright	4
4	auvcontact	5
5	moveup	6
6	moveup	7
7	moveleft	8