

Figure 1 consists of three state transition matrices labeled (a), (b), and (c). Each matrix has four columns representing movement directions: N (North), E (East), S (South), and W (West). The rows represent time ticks from 0 to 3. The input memory column indicates the previous state of the agent. Cells contain tuples where the first element is the next memory state and the second is a movement direction or an empty set  $\emptyset$ . Shaded cells represent erroneous states.

	N	E	S	W
0	1, N			3, W
1	2, $\emptyset$			1, $\emptyset$
2	2, $\emptyset$			2, $\emptyset$
3	3, $\emptyset$			3, $\emptyset$

	N	E	S	W
0	0, N	1, $\emptyset$		
1	2, $\emptyset$	2, $\emptyset$		
2	3, N	3, E		
3	3, $\emptyset$	0, $\emptyset$		

	N	E	S	W
0		1, $\emptyset$	1, $\emptyset$	
1		2, $\emptyset$	2, $\emptyset$	
2		3, E	3, S	
3		0, $\emptyset$	3, $\emptyset$	

(a) State Machine of agent at state 1 (b) State Machine of agent at state 2 (c) State Machine of agent at state 3

Figure 1 consists of three state transition matrices labeled (d), (e), and (f). Each matrix has four columns representing movement directions: N (North), E (East), S (South), and W (West). The rows represent time ticks from 0 to 3. The input memory column indicates the previous state of the agent. Cells contain tuples where the first element is the next memory state and the second is a movement direction or an empty set  $\emptyset$ . Shaded cells represent erroneous states.

	N	E	S	W
0			1, $\emptyset$	0, $\emptyset$
1			2, $\emptyset$	1, $\emptyset$
2			3, S	2, $\emptyset$
3			3, $\emptyset$	3, $\emptyset$

	N	E	S	W
0	0, N	1, $\emptyset$		0, W
1	2, $\emptyset$	2, $\emptyset$		1, $\emptyset$
2	3, N	3, E		2, $\emptyset$
3	3, $\emptyset$	0, $\emptyset$		3, $\emptyset$

	N	E	S	W
0	0, N	2, $\emptyset$	0, $\emptyset$	
1	1, $\emptyset$	2, $\emptyset$	1, $\emptyset$	
2	3, N	2, $\emptyset$	3, S	
3	3, $\emptyset$	2, $\emptyset$	3, $\emptyset$	

(d) State Machine of agent at state 4 (e) State Machine of agent at state 5 (f) State Machine of agent at state 6

Figure 1 consists of three state transition matrices labeled (g), (h), and (i). Each matrix has four columns representing movement directions: N (North), E (East), S (South), and W (West). The rows represent time ticks from 0 to 3. The input memory column indicates the previous state of the agent. Cells contain tuples where the first element is the next memory state and the second is a movement direction or an empty set  $\emptyset$ . Shaded cells represent erroneous states.

	N	E	S	W
0		1, $\emptyset$	1, $\emptyset$	0, $\emptyset$
1		2, $\emptyset$	2, $\emptyset$	1, $\emptyset$
2		3, E	3, S	2, $\emptyset$
3		0, $\emptyset$	3, $\emptyset$	3, $\emptyset$

	N	E	S	W
0	1, N		1, $\emptyset$	0, $\emptyset$
1	1, $\emptyset$		2, $\emptyset$	1, $\emptyset$
2	2, $\emptyset$		3, S	2, $\emptyset$
3	3, $\emptyset$		3, $\emptyset$	3, $\emptyset$

	N	E	S	W
0	0, N	2, $\emptyset$	0, $\emptyset$	0, $\emptyset$
1	1, $\emptyset$	2, $\emptyset$	1, $\emptyset$	1, $\emptyset$
2	3, N	2, $\emptyset$	3, S	2, $\emptyset$
3	3, $\emptyset$	2, $\emptyset$	3, $\emptyset$	3, $\emptyset$

(g) State Machine of agent at state 7 (h) State Machine of agent at state 8 (i) State Machine of agent at state 9

Figure 1: Agent state machines at different positions on the patch, a tuple designates next memory state and a picked movement direction, or *do nothing* otherwise. Empty hatched cells should be treated as erroneous states. Input direction is a position of empty cell at the beginning of time tick. In the absence of neighboring empty cell agents *do nothing* (not shown).