Tema 2 (II): Representación del Conocimiento. Representación Basada en Reglas

Ejemplo de Sistemas Basados en Reglas (II): Zeus: Laberinto

Maze Navigator: SBR

BH
(agentsName N1)

BH
(agentRegistered E1)

Funcionamiento

Maze Navigator: SBR

BH

(agentsName N1)

BH

(agentRegistered E1)

(agentsName N1)

Funcionamiento

Sistemas de Representación y Procesamiento Automático del Conocimiento

Maze Navigator: SBR

BH

(agentsName N1)

(agentRegistered E1)

BH

(agentRegistered E1)

(agentsName N1)

(inMaze (isInMaze true)
(name N1))

(moveMade (moved false))

Funcionamiento

Maze Navigator: SBR

BH

(agentsName N1)

(agentRegistered E1)

(inMaze (isInMaze true))

(thisMove (north false)
(west false)
(east false)
(south false))

BH

(agentRegistered E1)

(agentsName N1)

(inMaze (isInMaze true)
(name N1))

(moveMade (moved false))

Funcionamiento

Maze Navigator: SBR

BH

(agentsName N1)

(agentRegistered E1)

(inMaze (isInMaze true))

(thisMove (north false)
(west false)
(east false)
(south false))

(obstacle (north false)
(west false)
(east false)
(south false))

BH

(agentRegistered E1)

(agentsName N1)

(inMaze (isInMaze true)
(name N1))

(moveMade (moved false))

(obstacle (north false) (west false) (east false) (south false))

Funcionamiento

Maze Navigator: SBR

BH

(agentsName N1)

(agentRegistered E1)

(inMaze (isInMaze true))

(thisMove (north true)
(west false)
(east false)
(south false))

(obstacle (north false)
(west false)
(east false)
(south false))

BH

(agentRegistered E1)

(agentsName N1)

(inMaze (isInMaze true)
(name N1))

(moveMade (moved false))

(obstacle (north false) (west false) (east false) (south false))

Funcionamiento

Sistemas de Representación y Procesamiento Automático del Conocimiento

Maze Navigator: SBR

BH

(agentsName N1)

(agentRegistered E1)

(inMaze (isInMaze true))

(thisMove (north true)
(west false)
(east false)
(south false))

(obstacle (north true)
(west false)
(east false)
(south false))

BH

(agentRegistered E1)

(agentsName N1)

(inMaze (isInMaze true)
(name N1))

(moveMade (moved true))

(obstacle (north true) (west false) (east false) (south false))

Funcionamiento

Maze Navigator: SBR

BH

(agentsName N1)

(agentRegistered E1)

(inMaze (isInMaze true))

(thisMove (north false)
(west true)
(east false)
(south false))

(obstacle (north false)
(west false)
(east false)
(south false))

BH

(agentRegistered E1)

(agentsName N1)

(inMaze (isInMaze true)
(name N1))

(moveMade (moved false))

(obstacle (north true) (west false) (east false) (south false))

Funcionamiento

Sistemas de Representación y Procesamiento Automático del Conocimiento

Maze Navigator: SBR

BH

(agentsName N1)

(agentRegistered E1)

(inMaze (isInMaze true))

(thisMove (north true)
(west false)
(east false)
(south false))

BH

(agentRegistered E1)

(agentsName N1)

(inMaze (isInMaze true)
(name N1))

(moveMade (moved true))

(obstacle (north true) (west false) (east false) (south false))

(mazeExited (id N1))

Funcionamiento

Maze Navigator: SBR

Petición de registro en el Entorno

 **Nombre** 

```
(defrule registerWithEnvironment
   ?aN <- (agentsName (name ?var6))
   =>
   (send_message (receiver Environment) (content ?aN) (type inform))
)
```

Agente Registrado

 **Registrado** 

```
(defrule respondReg
   (agentsName (name ?var194))
   ?ar <- (agentRegistered (name ?var199))
   =>
   (send_message (receiver ?var194) (content ?ar) (type inform))
   (assert (inMaze (isInMaze true) (name ?var194)))
)
```

Definición de Reglas

Maze Navigator: SBR

 **Obstáculos** 

Movimiento Correcto: Envío de nuevos obstáculos

```
(defrule firstLegalMove
   ?move <- (moveMade (moved true))
   ?obst <- (obstacle (north ?var6) (west ?var7) (east ?var8) (south ?var9))
   =>
   (send_message (receiver Navigator) (content ?obst) (type inform))
   (retract ?move)
   (retract ?obst)
)
```

Movimiento Incorrecto: Envío de obstáculos

```
(defrule illegalMove
   ?move <- (moveMade (moved false))
   ?obst <- (obstacle (north ?var6) (west ?var7) (east ?var8) (south ?var9))
   =>
   (send_message (receiver Navigator) (content ?obst) (type inform))
   (retract ?move)
   (retract ?obst)
)
```

Definición de Reglas

Maze Navigator: SBR

Dentro del Laberinto

```
(defrule sendInMaze
    ?im <- (inMaze (isInMaze true) (name ?var269))
    =>
    (send_message (receiver ?var269) (content ?im) (type inform))
  )
```

Fuera del Laberinto

```
(defrule sendExited
    ?ex <- (mazeExited (id ?varH))
    =>
    (send_message (receiver ?varH) (content ?ex) (type inform))
  )
```

Definición de Reglas

Maze Navigator: SBR

Primer movimiento: Hacia el Norte

```
(defrule start
    ?obs <- (obstacle (north ?var179) (west ?var180) (east ?var181)
                      (south ?var182))
    ?lastMove <- (thisMove (north false) (west false) (east false)
                           (south false))
    ?agentReg <- (agentRegistered (name ?var15))
    ?inMaze <- (inMaze (isInMaze true))
    =>
    (modify ?lastMove (north true) (west false) (east false) (south false))
    (send_message (receiver ?var15) (content ?lastMove) (type inform))
    (retract ?obs)
  )
```

Definición de Reglas

Maze Navigator: SBR

Movimiento: Seguir paredes

```
(defrule followWall_east9
    ?obst <- (obstacle (north true) (east false))
    ?agentReg <- (agentRegistered (name ?var15))
    ?lastMove <- (thisMove (east true))
    ?inMaze <- (inMaze (isInMaze true))
    =>
    (modify ?lastMove (north false) (west false) (east true) (south false))
    (send_message (receiver ?var15) (content ?lastMove) (type inform))
    (retract ?obst)
)
```

Definición de Reglas

Maze Navigator: SBR

Movimiento: Seguir paredes

```
(defrule followWall_north9
    ?obst <- (obstacle (north false) (west true))
    ?agentReg <- (agentRegistered (name ?var15))
    ?lastMove <- (thisMove (north true))
    ?inMaze <- (inMaze (isInMaze true))
    =>


    (retract ?obst)
)
```

Definición de Reglas

Maze Navigator: SBR

Movimiento: Seguir paredes

```
(defrule followWall_west9
    ?obst <- (obstacle (west false) (south true))
    ?agentReg <- (agentRegistered (name ?var15))
    ?lastMove <- (thisMove (west true))
    ?inMaze <- (inMaze (isInMaze true))
    =>
    (modify ?lastMove (north false) (west true) (east false) (south false))
    (send_message (receiver ?var15) (content ?lastMove) (type inform))
    (retract ?obst)
)
```

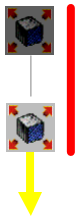
Definición de Reglas

Sistemas de Representación y Procesamiento Automático del Conocimiento

Maze Navigator: SBR

Movimiento: Seguir paredes

```
(defrule followWall_south9
    ?obst <- (obstacle (east true) (south false))
    ?agentReg <- (agentRegistered (name ?var15))
    ?lastMove <- (thisMove (south true))
    ?inMaze <- (inMaze (isInMaze true))
    =>
    (modify ?lastMove (north false) (west false) (east false) (south true))
    (send_message (receiver ?var15) (content ?lastMove) (type inform))
    (retract ?obst)
)
```

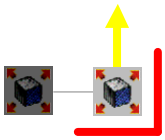


Definición de Reglas

Maze Navigator: SBR

Movimiento: Camino Bloqueado

```
(defrule going_east_blocked_east
    ?obst <- (obstacle (east true) (south true))
    ?agentReg <- (agentRegistered (name ?var15))
    ?lastMove <- (thisMove (east true))
    ?inMaze <- (inMaze (isInMaze true))
    =>
    (modify ?lastMove (north true) (west false) (east false) (south false))
    (send_message (receiver ?var15) (content ?lastMove) (type inform))
    (retract ?obst)
)
```



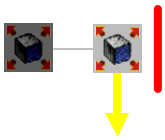
Definición de Reglas

Sistemas de Representación y Procesamiento Automático del Conocimiento

Maze Navigator: SBR

Movimiento: Camino Bloqueado

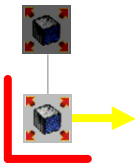
```
(defrule going_east_blocked_east_openSouth
    ?obst <- (obstacle (east true) (south false))
    ?agentReg <- (agentRegistered (name ?var15))
    ?lastMove <- (thisMove (east true))
    ?inMaze <- (inMaze (isInMaze true))
    =>
    (modify ?lastMove (north false) (west false) (east false) (south true))
    (send_message (receiver ?var15) (content ?lastMove) (type inform))
    (retract ?obst)
)
```



Definición de Reglas

Maze Navigator: SBR

Movimiento: Camino Bloqueado



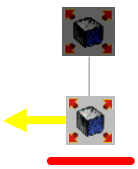
```
(defrule going_south_blocked_south
    ?obst <- (obstacle (west true) (south true)))
    ?agentReg <- (agentRegistered (name ?var15)
    ?lastMove <- (thisMove (south true))
    ?inMaze <- (inMaze (isInMaze true))
    =>
    (modify ?lastMove (north false) (west false) (east true) (south false))
    (send_message (receiver ?var15) (content ?lastMove) (type inform))
    (retract ?obst)
)
```

Definición de Reglas

Sistemas de Representación y Procesamiento Automático del Conocimiento

Maze Navigator: SBR

Movimiento: Camino Bloqueado

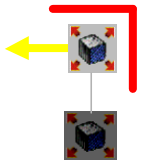


```
(defrule going_south_blocked_south_openWest
    ?obst <- (obstacle (west false) (south true))
    ?agentReg <- (agentRegistered (name ?var15))
    ?lastMove <- (thisMove (south true))
    ?inMaze <- (inMaze (isInMaze true))
    =>
    (modify ?lastMove (north false) (west true) (east false) (south false))
    (send_message (receiver ?var15) (content ?lastMove) (type inform))
    (retract ?obst)
)
```

Definición de Reglas

Maze Navigator: SBR

Movimiento: Camino Bloqueado



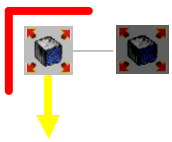
```
(defrule going_north_blocked_north
    ?obst <- (obstacle (north true) (east true)))
    ?agentReg <- (agentRegistered (name ?var15)
    ?lastMove <- (thisMove (north true))
    ?inMaze <- (inMaze (isInMaze true))
    =>
    (modify ?lastMove (north false) (west true) (east false) (south false))
    (send_message (receiver ?var15) (content ?lastMove) (type inform))
    (retract ?obst)
)
```

Definición de Reglas

Sistemas de Representación y Procesamiento Automático del Conocimiento

Maze Navigator: SBR

Movimiento: Camino Bloqueado



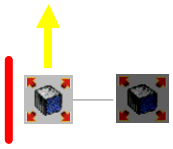
```
(defrule going_west_blocked_west
    ?obst <- (obstacle (north true) (west true))
    ?agentReg <- (agentRegistered (name ?var15))
    ?lastMove <- (thisMove (west true))
    ?inMaze <- (inMaze (isInMaze true))
    =>
    (modify ?lastMove (north false) (west false) (east false) (south true))
    (send_message (receiver ?var15) (content ?lastMove) (type inform))
    (retract ?obst)
)
```

Definición de Reglas

Maze Navigator: SBR

Movimiento: Camino Bloqueado

```
(defrule going_west_blocked_west_openNorth
    ?obst <- (obstacle (north false) (west true))
    ?agentReg <- (agentRegistered (name ?var15))
    ?lastMove <- (thisMove (west true))
    ?inMaze <- (inMaze (isInMaze true))
    =>
    (modify ?lastMove (north true) (west false) (east false) (south true))
    (send_message (receiver ?var15) (content ?lastMove) (type inform))
    (retract ?obst)
)
```

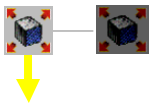


Definición de Reglas

Maze Navigator: SBR

Movimiento: Cruce

```
(defrule junctionSouth_going_West
    ?obst <- (obstacle (south false))
    ?agentReg <- (agentRegistered (name ?var15))
    ?lastMove <- (thisMove (west true))
    ?inMaze <- (inMaze (isInMaze true))
    =>
    (modify ?lastMove (north false) (west false) (east false) (south true))
    (send_message (receiver ?var15) (content ?lastMove) (type inform))
    (retract ?obst)
)
```

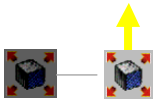


Definición de Reglas

Maze Navigator: SBR

Movimiento: Cruce

```
(defrule junctionNorth_going_East
    ?obst <- (obstacle (north false))
    ?agentReg <- (agentRegistered (name ?var15))
    ?lastMove <- (thisMove (east true))
    ?inMaze <- (inMaze (isInMaze true))
    =>
    (modify ?lastMove (north true) (west false) (east false) (south false))
    (send_message (receiver ?var15) (content ?lastMove) (type inform))
    (retract ?obst)
)
```



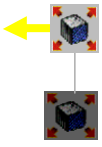
Definición de Reglas

Sistemas de Representación y Procesamiento Automático del Conocimiento

Maze Navigator: SBR

Movimiento: Cruce

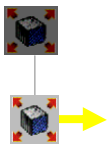
```
(defrule junctionWest_goingNorth
    ?obst <- (obstacle (west false))
    ?agentReg <- (agentRegistered (name ?var15))
    ?lastMove <- (thisMove (north true))
    ?inMaze <- (inMaze (isInMaze true))
    =>
    (modify ?lastMove (north false) (west true) (east false) (south false))
    (send_message (receiver ?var15) (content ?lastMove) (type inform))
    (retract ?obst)
)
```



Definición de Reglas

Maze Navigator: SBR

Movimiento: Cruce



```
(defrule junctionEast_goingSouth
    ?obst <- (obstacle (east false))
    ?agentReg <- (agentRegistered (name ?var15))
    ?lastMove <- (thisMove (south true))
    ?inMaze <- (inMaze (isInMaze true))
    =>
    (modify ?lastMove (north false) (west false) (east true) (south false))
    (send_message (receiver ?var15) (content ?lastMove) (type inform))
    (retract ?obst)
)
```

Definición de Reglas