

Ita: a Vacuum World EIS Environment

Howell Jordan and Rem Collier
University College Dublin

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Environment Description:

This environment simulates a 2-dimensional grid world, populated with fixed obstacles, dust, and vacuum cleaning robots called VacBots. The VacBots are controllable entities; their task is to move around the grid, avoiding the obstacles, and finding and cleaning the colourful dust. In the default configuration, the size of the world is 16 x 8 squares; there are 8 randomly-placed obstacles, 32 random dusty squares, and 4 randomly-placed VacBots. Dust, once cleaned, does not regenerate. This default configuration can be changed by editing the file `conf/ita.conf`, which includes documentation for each configuration option.

JAR File: `ita-2.1.0.jar`

Entities:

Decco, Harry, Henry, Lloyd, Keano, Stevo, Benjy, Darth

Available VacBot instances. Note that, in the default configuration, only the first four of these are available. VacBots can turn, move around the grid, clean dust, and flash their warning lights.

Actions:

`move(Identifier)` Moves the VacBot one square in the specified direction, turning it first if necessary. Valid directions can be absolute (`north`, `south`, `east`, or `west`) or relative (`forward`, `left`, `right`, or `back`). This action will throw an `ActException` of type `FAILURE` if it is invoked while the VacBot is moving or cleaning.

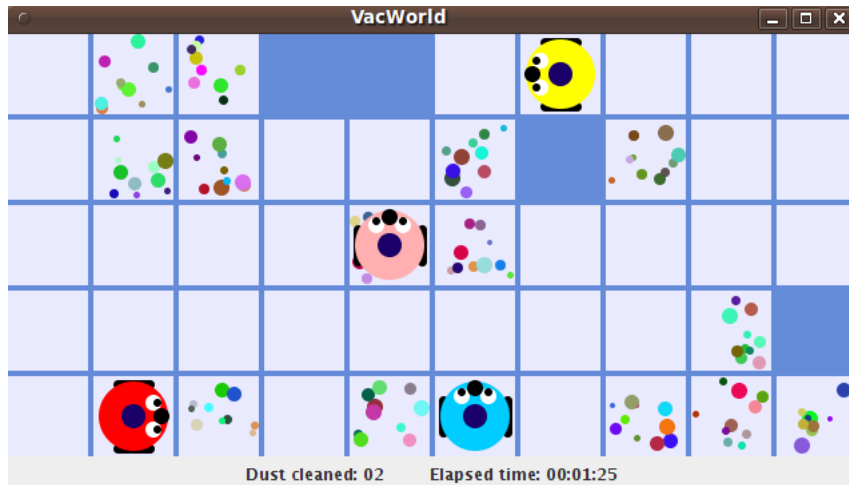


Figure 1: A grid world of robotic vacuum cleaners and brightly-coloured dust. Empty squares are shown in light grey, and fixed obstacles are dark blue.

The VacBot carries out the requested move on a best-effort basis. If the moving VacBot meets another VacBot, a permanent obstacle, or the edge of the grid, it halts and throws an `ActException` of type `FAILURE`. The exception message indicates whether the failure was temporary (caused by another VacBot) or permanent (caused by a fixed obstacle or the edge of the grid).

`move(Identifier, Numeral)` Moves the VacBot in the specified direction, for the specified distance, turning it first if necessary. Valid directions can be absolute (`north`, `south`, `east`, or `west`) or relative (`forward`, `left`, `right`, or `back`). The distance is a positive integer representing the number of squares to be moved; a distance value of 0 can be used to turn the entity without moving. This action will throw an `ActException` of type `FAILURE` if it is invoked while the VacBot is moving or cleaning.

The VacBot carries out the requested move on a best-effort basis. If the moving VacBot meets another VacBot, a permanent obstacle, or the edge of the grid, it halts and throws an `ActException` of type `FAILURE`. The exception message indicates whether the failure was temporary (caused by another VacBot) or permanent (caused by a fixed obstacle or the edge of the grid).

`light(Identifier)` Turns the warning light on or off.

`clean()` Cleans the square currently occupied by the VacBot, if it is

dusty. If the square is already clean, this action returns immediately. This action will throw an `ActException` of type `FAILURE` if it is invoked while the VacBot is moving or cleaning.

Percepts:

`location(Numerical, Numerical)` The VacBot's current location on the grid, in (X,Y) coordinates. The square in the top left corner is numbered (0,0). This percept is only available when the VacBot is not moving between squares.

`direction(Identifier)` The VacBot's current absolute direction, one of `north`, `south`, `east`, or `west`. This percept is only available when the VacBot is not turning or cleaning.

`light(Identifier)` The status of the Vacbot's light, either `on` or `off`.

`square(Identifier squareName, Identifier squareContents)`

Six instances of this percept represent the VacBot's field of vision. The square name is one of `left`, `forwardLeft`, `forward`, `forwardRight`, `right`, or `here`. The square contents is one of `obstacle`, `vac`, `dust`, or `empty`. Note that if the VacBot perceives another VacBot occupying a dusty square, the square contents will take the value `vac`. Note also that the VacBot does not perceive itself; the square contents for the square `here` is always either `dust` or `empty`. These percepts are only available when the VacBot is not moving, turning, or cleaning.

`task(Identifier)` The VacBot's current task. The possible tasks are `turn`, `move`, and `clean`; or `none` if the VacBot is idle.

Environment Management:

No environment management commands are supported. The environment runs until it is terminated by the user or by the operating system.