

| Function                                | Information   |
|---|---|
| <b>From Game</b>                        |   |
| getWaypoints()                          | Returns the list with all the waypoints in the map.   |
| getWaypointsLeft()                      | Indicates the number of waypoints that are still to be visited.   |
| getWaypointsVisited()                   | Returns the number of waypoints visited in this play.   |
| getTotalTime()                          | Gets the time spent since the beginning of the game.  |
| getStepsLeft()                          | Returns the steps left until the time runs out.   |
| getMap()                                | Returns the map of the game (instance of Map).  |
| getMapSize()                            | Returns the dimensions of the map (instance of java.awt.Dimension).   |
| getShip()                               | Gets the ship of the game (instance of class Ship).   |
| isEnded()                               | Indicates if the game is ended.   |
| advanceMap()                            | Advances the current map to the next loaded one.  |
| getVisitOrder()                         | Returns the visit order of the game so far.   |
| getCopy()                               | Gets a copy of the whole game state in a Game object.   |
| <b>From Waypoint</b>                    |   |
| isCollected()                           | Indicates if this waypoint has been collected/visited.  |
| Vector2d s                              | Indicates the position of this waypoint.  |
| RADIUS                                  | Represents the radius (number of pixels) of the waypoints.  |
| <b>From Map</b>                         |   |
| getMapChar()                            | Gets a bi-dimensional array with the contents of the current map. Each position is a pixel on the map, and a character of the map file.                     |
| getMapHeight()                          | Gets the height of the map (in pixels).   |
| getMapWidth()                           | Returns the width of the map (in pixels).   |
| getStartingPoint()                      | Gets the starting point of the ship.  |
| isObstacle(x,y)                         | Returns true if there is an obstacle in the position given.   |
| LineOfSight(origin, destination)        | Checks if there are no obstacles from the origin position to the destination (considering ship radius).   |
| distToCollision(v,w,d)                  | Returns the distance to a potential obstacle from a given point (v), in a specified direction (w) an up to a maximum distance (d). Gets -1 if no collision. |
| getCopy()                               | Gets a copy of the Map object.  |
| <b>From Ship</b>                        |   |
| getCollLastStep()                       | Indicates if there was a collision in the last step.  |
| update(action)                          | Performs the action provided.   |
| getCopy()                               | Gets a copy of the Ship object.   |
| Vector2d s                              | Position of the ship.   |
| Vector2d sp                             | Position of the ship in the previous step.  |
| Vector2d v                              | Velocity of the ship.   |
| Vector2d d                              | Direction of the ship (where the ship is facing, not necessarily the same as Velocity).   |
| SHIP_RADIUS                             | Represents the radius (number of pixels) of the ship.   |
| <b>From Controller (static methods)</b> |   |
| getThrust(action)                       | Returns <b>true</b> if the action given accelerates the ship.   |
| getTurning(action)                      | Returns -1, 1 or 0 if the action given rotates left, right or none, respectively.   |
| getActionFromInput(thrust, turn)        | Given an acceleration boolean and a turn sense, returns the desired action identifier.  |

TABLE I: Code interface.

| Constant                                | Information   |
|---|---|
| PTSPConstants.DELAY                     | Delay in milliseconds between screenshots (used for replays and human plays).   |
| PTSPConstants.T                         | Physics time.   |
| PTSPConstants.STEPS_PER_WAYPOINT        | Number of steps allowed until reaching the next waypoint.   |
| PTSPConstants.COLLISION_SPEED_RED       | The velocity of the ship will be multiplied by this amount when colliding.  |
| PTSPConstants.INIT_TIME_MS              | Time for the controller to be initialized.  |
| PTSPConstants.ACTION_TIME_MS            | Time for the controller to provide an action every step.  |
| PTSPConstants.TIME_ACTION_DISQ          | If the controller spends more than TIME_ACTION_DISQ to reply with an action, it gets disqualified from this game (getting 0 wp and getStepsPerWaypoints() time steps as score). |
| PTSPConstants.getStepsPerWaypoints(nwp) | Returns the number of time steps until reaching the next waypoint. nwp is the number of waypoints of the map.   |
| Controller .ACTION_NO_FRONT             | Action: No thrust, no rotation.   |
| Controller .ACTION_NO_LEFT              | Action: No thrust, rotate left.   |
| Controller .ACTION_NO_RIGHT             | Action: No thrust, rotate right.  |
| Controller .ACTION_THR_FRONT            | Action: Thrust, no rotation.  |
| Controller .ACTION_THR_LEFT             | Action: Thrust, rotate left.  |
| Controller .ACTION_THR_RIGHT            | Action: Thrust, rotate right.   |
| Controller .NUM_ACTIONS                 | Number of different actions that can be applied at each step.   |
| Controller .HALF_PI                     | $\pi / 2$   |
| Controller .QUARTER_PI                  | $\pi / 4$   |

TABLE II: Useful constants.