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Map

- obstacles: std::vector<Polygon>
- offset_obstacles_: std::vector<Polygon>
- clearance_: double

+ insideObstacle(geometry_msgs::point): bool
+ polyFromRect(std::map<string,double): Polygon
+ polyFromCircle(std::map<string,double>): Polygon
+ parseYAML(std::string): void
- offset_polygon(Polygon): Polygon

PathPlanner

+ map: Map
- grid_size: double

+ A_star(geometry_msgs::Point, geometry_msgs::Point): std::vector<geometry_msgs::Point>
+ checkNeighbors(Node&, Node&): std::vector<Node>

Navigator

- found_object_: bool
- path_planner: PathPlanner
- euler_waypoints: std::vector<geometry_msgs::Point>
- current_waypoint: int
- lidar_sub: ros::Subscriber
- odom_sub: ros::Subscriber
- transform: tf::Transform
- br: tf::TransformBroadcaster
- nh: ros::NodeHandle

+ lidarCallback(sensor_msgs::LaserScan &msg): void
+ checkCollectionObject(std::vector<double>): void
+ followEulerPath(): void
+ goToCollectionObject(): void
+ driveToDropOff(): void
+ returnToEulerPath(): void

Manipulator

- pick_waypoints_: std::vector<geometry_msgs::Pose>
- place_waypoints_: std::vector<geometry_msgs::Pose>
- end_effector_publisher_: ros::Publisher

+ pickPart(): void
+ placePart(): void

Polygon

- vertices: std::vector<geometry_msgs::Point>
- n: int
- centroid: geometry_msgs::Point
- lines: std:vector<Line>

+ getVertices(): std::vector<geometry_msgs::Point>
+ Polygon(std::vector<geometry_msgs::Point>:void
+ calculate_centroid(): void
+ getCentroid(): geometry_msgs::Point
+ insideObject(geometry_msgs::Point): bool

Decoder

- camera_sub: ros::Subscriber
- order_sub: ros::Subscriber

+ cameraCallbacks(sensor_msgs::Image &msg): void
+ decodeQr(sensor_msgs::Image): std::string
+ inOrder(std::string): bool

Line

+ a: double
+ b: double
+ c: double
- geometry_msgs::Point: point_1_
- geometry_msgs::Point: point_2_
- geometry_msgs::Point: test_point_

+ Line(geometry_msgs::Point, geometry_msgs::Point, geometry_msgs::Point)
+ calculateCoefficients(): void

Controller

+ cmd_vel_pub: ros::Publisher

+ drive_to_waypoint(geometry_msgs::Pose): void

Order_Manager

- order_: std::vector<int>
- cubes_: std::vector<int>
- order_pub_: ros::Publisher
- nh_: ros::NodeHandle
- order_num_: int
- total_cubes_: int
- map_object_: Map
- clearance_: double

+ spawnCubes(): void
+ generateOrder(int, int): void
+ getTotalCubes(): int
+ getOrderSize(): int
+ getOrder(): std::vector<char>
+ getCubes(): std::vector<char>

Node

+ position::geometry_msgs::Point
+ parent::geometry_msgs::Point
+ g: double
+ h: double
+ f: double
+ id:: std::string

+ generate_id(): void
+ operator==(const Node&): bool