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Software Design - 1

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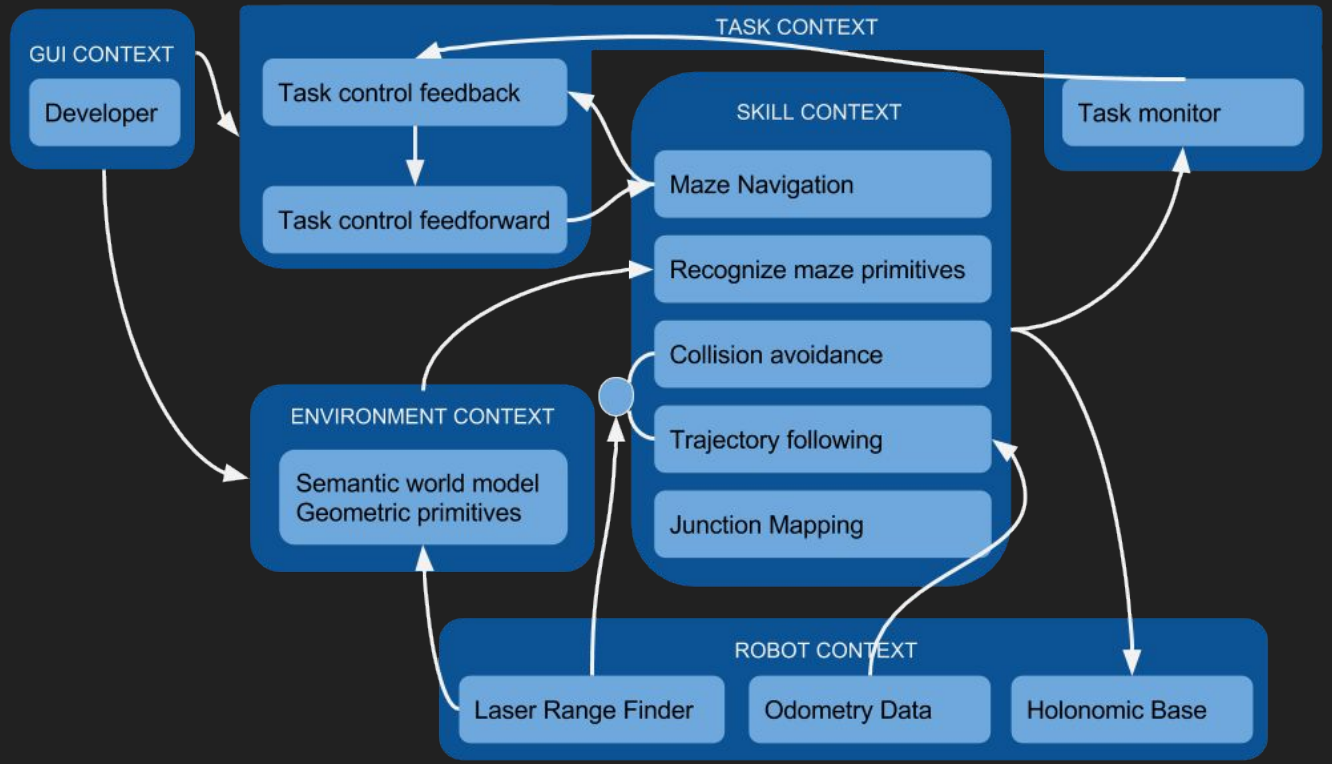
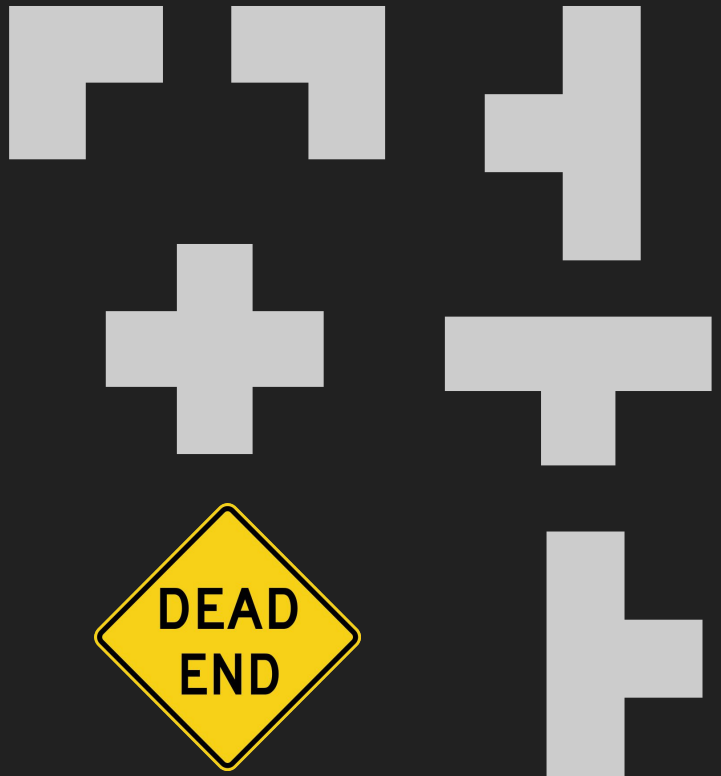
Behavior System Model



Mission - Task - Motion

Which corridors to follow and where has the robot already been?

- Every turn/crossroad/T-section/dead-end considered a **node**
- Nodes are connected by the **distance** between them
- These distances are the **cost** that we have to pay to reach our goal (exit)
- Implemented in a search algorithm like **Dijkstra, A*, Tremaux**



Mission - Task - Motion

Selecting a trajectory to reach next corridor

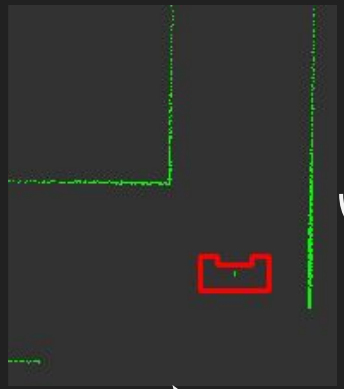
- Go forward
- Avoid Obstacles
- Align the robot
- Detect nodes
- Compute next node (make decision for next move)
- Develop trajectory to next corridor from the current position

Mission - Task - Motion

Go forward while searching for geometric primitive patterns

Detect node

Go to node



Turn according to the algorithm used (Mission)

Go forward while searching...

Mission - Task - Motion

Sample Laser Range Finder (LRF) and odometry data

Follow plan trajectory based on data

Select velocity profile (e.g. in the corners the robot drives with a smaller speed etc)

Structure Model

Interconnection of Behaviors and Activities. Described by 5Cs:

- Computation: Represents the core functionality of the robot (behavior)
- Configurator: Configures computational elements
- Coordinator: Triggers/Stops computational elements
- Communication: Data exchange between elements
- Composition: Describes the coupling among the above ^

Composition Pattern