Multi-Objective Path Planning

Supporting the human’s role from controller to manager in a human robot team, a planning framework is provided to support the versatile verbal requirements abstracts from a high level command.

Requirement abstractions of a task can be obtained by a grammar parser. On a map with semantic label, the task properties and task objectives form a sequence of points, while the adverb property determines how the trajectories connecting waypoints are like by a form of multi-objective optimization.

In parsing a command by predefined grammar, the objectives can be decomposed into two layers, which are strong type and weak type. The strong type objectives forms a sequence of waypoints on a semantic labeled map, while the weak type objectives determines how to transit between two waypoints. Both two layers shape multi-objective optimization problems in different forms and constraints.