Predictive Epistmic MRTA Constraints

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Chapter 1

One Robot Constraints

1.1 Explanation

1.1.1 z

z is a binary TxT matrix representing the path a robot will go down, with component j represents the task the robot is on, and component i represents what task the robot will go to.

1.1.2 y

y is a 1xT matrix where n represents the order in which the task is completed

1.2 Lower and Upper Bounds

$$\forall i, j \ 0 \leq z_{i,j} \leq 1$$

$$n = [2, ..., T] \ 2 \leq y_n \leq T$$

1.3 Linear Inequality Constraints

$$i, j = [2, ..., T] \ y_i - y_j + (T-1)z_{ij} \leq T - 2$$

1.4 Linear Equality Constraint

$$\forall j, i = [2, ..., T] \ \sum_j z_{i,j} = 1$$

$$\forall i, j = [1, ..., T-1] \ \sum_i z_{i,j} = 1$$

$$\forall i, j \ \sum_i \sum_j z_{ij} = T - 1$$

$$\forall i \sum_i z_{ii} = 0$$

$$S = 1 \; y_S = 1$$

Chapter 2

Homogeneous Multi-Robot Constraints

In-Progress

Chapter 3

Heterogeneous Multi-Robot Constraints

Not Started