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Workspace ⇒ It is the real space in which the robot live and operate.

→ It is an Euclidean Space.

→ W

Configuration

→ Complete specification of the position of every point of the System.

→ denoted by q.

Configuration Space

→ Space of all possibe configuration of the System.

→ denoted by Q.

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* Continuous

Path

→ Path in Configuration Space is denoted by a *function

$$C : [0,1] \rightarrow Q$$

where, $C(0) = q_{start}$ $C(1) = q_{goal}$

& $C(s) \in Q_{free} \; \forall \; s \in [0,1]$

trajectory

→ When path is parameterized by time t, then C(t) is called trajectory.

degree of freedom

→ Dimension of Configuration Space.

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Constraints

→ Holonomic Constraint

→ It is the one that can be expressed purely as a function of configuration variables and possibly time of the form

$$g(q,t) = 0$$

→ Non-Holonomic Constraints

→ The one that cannot be expressed in the form

$$g(q,t) = 0$$

→ These are velocity constraints of the form:

$$g(q, \dot{q}, t) = 0$$