PROSJEKT OPT II

Task 1

Let $\vec{L}$ be a vector with $L_i = l_i$ being the i'th rigid element.

Let L_i be the largest element of L,

If $L_i > \sum_{i \neq j} L_j$ then $C = \{ \vec{p} \text{ s.t. } L_i \leq \|\vec{p}\| \leq \sum_{j=1}^{n} L_j \}$

otherwise $C = \{ \vec{p} \text{ s.t. } \|\vec{p}\| \leq \sum_{j=1}^{n} L_j \}$

Task 2

WTS that $\min \frac{1}{2} \| F(\theta) - p \|_2$ has a solution.

$d = \frac{1}{2} \| F(\theta) - p \|_2^2$ is a sum of continous functions

$\Rightarrow d$ is continous.

If $p \in C$, then the point is reachable and the function obtains a min, being 0.

If $p \notin C$

$\mathcal{J} \in \mathbb{R}^n$, but because $\cos(\cdot)$ and $\sin(\cdot)$ are periodic, we may write

$\mathcal{J} \in S^n$

where $S = [0, 2\pi)$ and 0 and 2π gives the same value.

Since S^n is compact and $d(\theta)$ is continous, we may apply the extreme value THM, which says that $d(\theta)$ must attain a min and max.