Convex Optimization: Part 3

Lecture 8-3 - CMSE 382

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This Lecture

Topics:

- Convex optimization with CVXPY
- Chebyshev center for a set of points

Announcements:

- Homework 4 due Friday.

Section 1

Convex Optimization Example: Chebyshev Center of a set of points

Chebyshev Center of a Set of Points

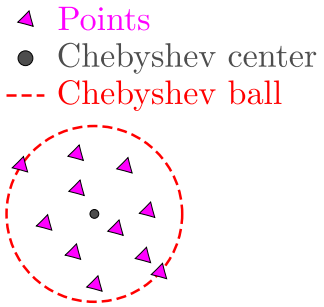
Given m points $\mathbf{a}_1, \mathbf{a}_2, \ldots, \mathbf{a}_m$ in $\mathbb{R}^n$, Find the center of the minimum radius closed ball containing all the points.

$$\begin{aligned} \min_{\mathbf{x},r} \quad & r \\ \text{s.t.} \quad & \mathbf{a}_i \in B[\mathbf{x}, r], i = 1, 2, \ldots, m. \end{aligned}$$

- Recall: $B[\mathbf{x}, r] = \{\mathbf{y} : \|\mathbf{y} - \mathbf{x}\| \leq r\}$.

The problem can be rewritten as

$$\begin{aligned} \min_{\mathbf{x},r} \quad & r \\ \text{s.t.} \quad & \|\mathbf{x} - \mathbf{a}_i\| \leq r, i = 1, 2, \ldots, m. \end{aligned}$$



Groups - Round 4

Group 1
Michal, Joseph, Saitej, Dev

Group 2
Kyle, Dori, Shanze, Jack

Group 3
Noah, Daniel, Lora, Scott

Group 4
Lowell, Tianjian, Aidan, Anthony

Group 5
Abigail, Breena, Arjun, Luis

Group 6
Purvi, Atticus, Andrew, Vinod

Group 7
Yousif, Jay, Arya, Morgan

Group 8
Jonid, Jake, Dominic, Maye

Group 9
Alice, K M Tausif, Monirul Amin, Ha

Group 10
Jamie, Zheng, Aaron, Long

Group 11
Lauryn, Karen, Sanskaar, Braedon

Group 12
Sai, Brandon, Igor, Quang Minh