PMRF-ISSS Teaching Programme

Prime Minister Research Fellowship students' teaching requirement

facilitated by the Institute of Smart Structures and Systems

Module PMRF-ISSS171/II/2024

Convex Optimization for MIMO Communications

Name of the PMRF student

Sourasis Chatterjee

Required background of the students taught

Electronics & Communication Engineering with exposure to basic communication theory and linear algebra.

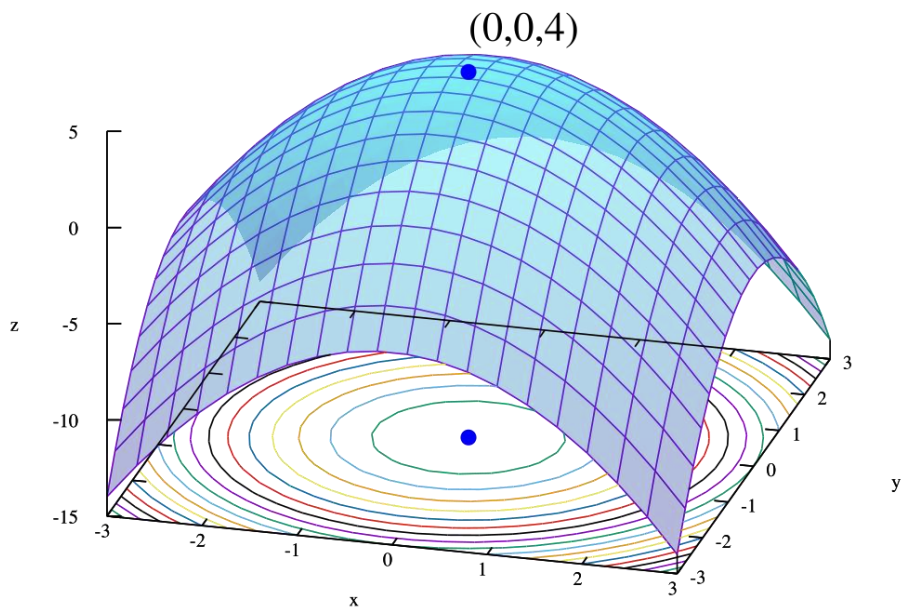

Image source: Wikipedia

Details of the content of the module

Lectures will cover following modules:

Module 1 - Refresher on linear algebra.

Module 2 - Introduction to mathematical optimization, fundamental convexity concepts (sets, functions etc.).

Module 3 - Duality theory and KKT conditions.

Module 4 - Linear, and quadratic optimization problems, and their practical application in MIMO communications.

Module 5 - Second order cone program (SOCP) and its wireless applications.

Module 6 - Semidefinite programming (SDP) and its application in MIMO domain.

Module 7 – Different techniques (SDR etc.) for the convexification of non-convex wireless problems.

Module 8 - Geometric programming and its applications.

Module 9 - State-of-the-art optimization techniques to address 5G-domain problems.

Schedule of the module

Start Date : 14/11/2024

End Date : 14/02/2025 (tentative)

Class Timing: Every Friday and Saturday (4-5:30 pm)

Meeting link : Will be shared later

Link

Contact email ID: isss.forum@gmail.com

Registration link: https://forms.gle/EA12wT8mjEnZiRAh9