PMRF-ISSS Teaching Programme

Prime Minister Research Fellowship students' teaching requirement facilitated by the Institute of Smart Structures and Systems

Module PMRF-ISSS154/II/2024

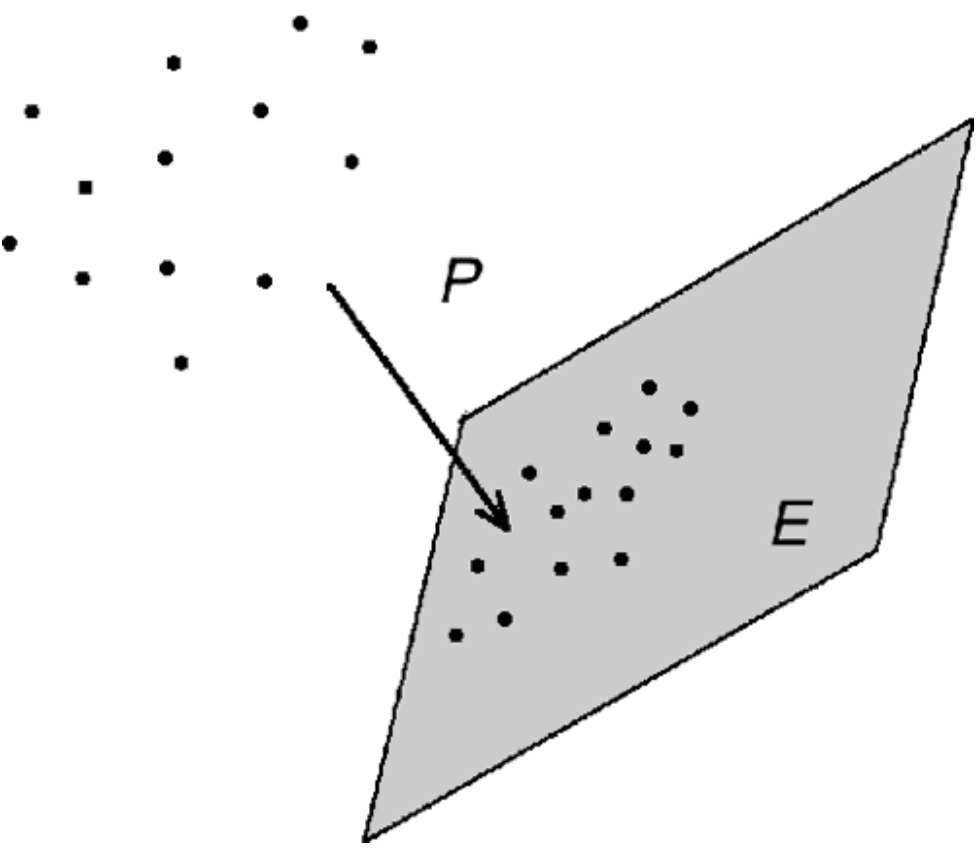
High Dimensional Probability and its Application in Computer Science

Name of the PMRF student

Kirtan Vora

Required background of the students taught

This lecture will be beneficial to students in Computer Science, Mathematics and Electrical Engineering



Details of the content of the module

Curse of dimensionality : Non-Trivial phenomenon in high dimensions and problem encountered in computation

Concentration of Sum of Independent Random Variables : Hoffding's Inequality, Chernoff's Inequality, Sub-Gaussian Distributions, General Hoeffding Inequalities, Sub-Exponential Distributions, Bernstein's Inequality.

Random Vectors in High Dimension : Concentration of the norm, Principal Component Analysis, High Dimensional Distributions, Grothendiek's Inequality and Semidefinite Programming, Max Cut for Graphs.

Random Matrices : Nets, Covering Number, Error Correcting Codes, Upper Bound on Norms and its Application in Community Detection and Planted Cliques in Graphs.

Sparse Recovery: High Dimensional Signal Recovery, Low Rank Matrix Recovery, Restricted Isometry Property.

Schedule of the module

Starts on : **28 September 2024**

Ends on : **29 November 2024**

Class Timings : **Monday to Saturday , 15:00 – 17:00 Hrs**
(Recording of live lectures will be provided after)

Total 26 Lectures (2hr/lecture)

Meeting link : Will be shared later

Link

Contact email ID: isss.forum@gmail.com

Registration link:
https://forms.gle/v94W77nsEWwzgJkr6