# PMRF-ISSS Teaching Programme

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

Module PMRF-ISSS175/III/2024

# Online Learning and Bandits Algorithms


**Name of the PMRF student**

Avik Kar

PhD fellow at dept. of ECE, IISc


**Required background of the students taught**

3rd/4th UG and PG students from any engineering discipline with interest in machine learning can take this course.
Prerequisite: A basic course on probability.

**Online session coordinator**

Will be chosen from the list of registrants

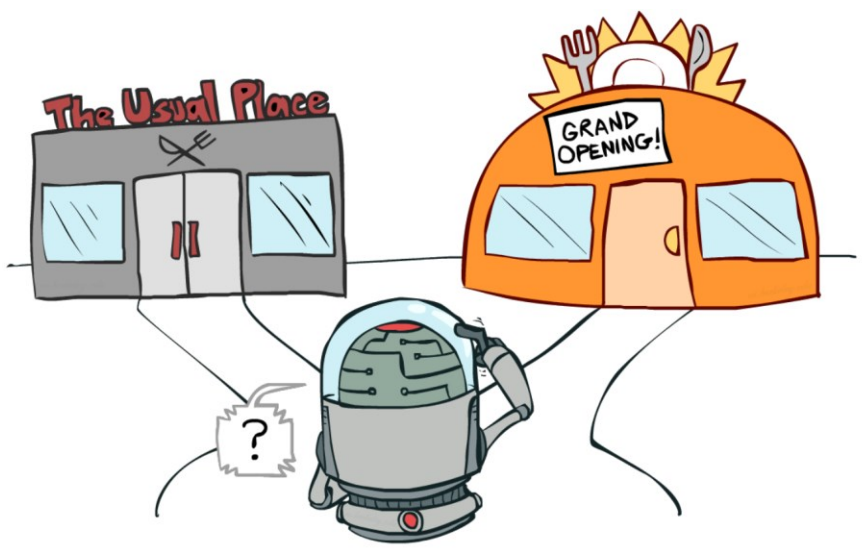


Image source: UC Berkeley AI course slide, lecture 11

**Details of the content of the module**

## Course Outline

1. Introduction to online learning
2. Online Convex Optimization:
    1. Follow the Leader
    2. Follow the Regularized Leader
    3. Online Gradient Descent
    4. Online Mirror Descent
3. Bandit algorithms
    1. Adversarial bandits
    2. Stochastic bandits
        1. Regret analysis for ETC, UCB, Thompson Sampling
        2. Lower bound on regret
        3. Linear Bandits

References:


1. **Online Learning and Online Convex Optimization** by Shai Shalev-Shwartz
2. **Bandit Algorithms** by Tor Lattimore and Csaba Szepesvari


**Schedule of the module**

Start date: 17/12/2024

End date: 28/02/2024

Lecture time: To be decided

Number of Lectures: 25, 1 hour each

Meeting link : Will be shared later

Contact email ID: isss.forum@gmail.com

Registration link: Click here or, scan the QR code