Module PMRF-ISSS099/IV/2025

Flavors of Diffusion Models

Name of the PMRF student

Piyush Lalitkumar Tiwary

Required background of the students taught

- Strong grasp on basics of probability theory is a must.
- Basics of Deep Learning concepts such as ERM, backpropagation, etc is a must.
- Basic knowledge of Diffusion models could help in better understanding of subject.
- The course would have theoretical inclination, hence it is expected that students are comfortable with theoretical topics.

Details of the content of the module

Goal:

The goal of this course is to introduce the students with different aspects of diffusion models. Particularly, we will see that there are different ways to look at diffusion models, further we will also see how these different perspectives are related to each others. This will include discussion of several research papers that have been published at top places in recent years.

Content:

1. Diffusion Models as Variational Autoencoders (VAEs)

2. Variational Diffusion Models

3. Understanding Diffusion Objectives as the ELBO with Simple Data Augmentation

4. Diffusion models with Inverse Heat Dissipation

5. Score Based Generative Models

6. Score-based Diffusion Models in Function Space

7. Block Diffusion: Interpolating Between Autoregressive and Diffusion Language Models

Schedule of the module

All lectures will be held in online mode. Applicants will be contacted via mail.

Start Date: 31/11/2025

End Date: 31/02/2026

Meeting link : Will be shared later

Link

Contact email ID: isss.forum@gmail.com

Registration link:
https://forms.gle/GqzZvPMyp28zVZQZ8