ICTS Synopsis Seminar

Title : A study of dynamical instabilities and filter stability using ensemble Kalman filters.

Speaker : Shashank Kumar Roy (ICTS-TIFR, Bengaluru)

Date : Thursday, 13th July 2023

Time : 11:00 AM (IST)

Abstract :
Data assimilation or filtering combines partial and noisy observations with the dynamics in order to sequentially estimate the state of a dynamical system. An important criteria for a robust filtering algorithm is that the choice of initialization does not affect the long term posterior conditional distribution of the state. This property is also known as nonlinear filter stability. We develop a method based on the Sinkhorn algorithm to numerically assess the stability of a general filtering algorithm. Additionally, in relation to the underlying dynamical system, we propose a method to compute Lyapunov vectors. In the setting of noisy and partial observations from a chaotic system where the true underlying trajectory remains unknown, we compute the Lyapunov vectors using a trajectory obtained from a filtering algorithm. To gain insights about the limitations, we also study the sensitivity of Lyapunov vectors and their subspaces to perturbations in the underlying trajectory.

Venue : Feynman Lecture Hall & Online
Zoom link: https://icts-res-in.zoom.us/j/84177458197?pwd=ME0vbnVsSE1majNvc2JaUlZNdjEyZz09
Meeting ID: 841 7745 8197
Passcode: 131322