

# Indian Statistical Institute

## Applied Statistics Unit

### SEMINAR NOTICE

**Speaker:** Sagnik Nandy, University of Pennsylvania

**Title:** Orchestrated AMP in Network-Constrained Regression

**Date:** 10 January, 2023

**Time:** 16:15 PM

**Venue:** ASU Seminar Room

**Online Platform:** Google Meet ([meet.google.com/obp-cunm-wuz](https://meet.google.com/obp-cunm-wuz))

#### **Abstract:**

In this talk, we shall explore a linear regression problem where the feature vectors are indexed by an undirected network. The smoothness of the regression parameters is characterized by the connectivity pattern of the observed network. Such data is common in several biological applications (Li and Li, 2010). The traditional approach to combine the linear model with such network side information is to use penalized least squares with a penalty on the Laplacian of the observed network (Li and Li, 2010; Tran et. al., 2022). However, such methods are extremely slow in high dimensions and not provably optimal. We apply the data integration techniques called the *Orchestrated Approximate Message Passing* introduced by Ma and Nandy (2021) to this problem. The resulting solution is shown to vastly outperform the traditional penalized estimators in terms of the reconstruction error. Our method is also extremely fast compared to existing methods and provably Bayes optimal in the proportional asymptotic regime when  $n/p \rightarrow c \in (0, \infty)$ .

This is a joint ongoing work with Subhabrata Sen.

**All are invited to attend.**