

## **Research Highlight: Gaussian Determinantal Processes: A new model for directionality in data**

### **Work of Assistant Professor Subhro Ghosh**

The increasingly complex nature of data calls for rethinking basic modelling assumptions. Determinantal point processes (DPPs) have recently become popular tools to model the phenomenon of negative dependence, or repulsion, in data. Prof Subhro GHOSH and his co-author Prof Philippe RIGOLLET, Massachusetts Institute of Technology, introduced a simple and flexible Gaussian DPP model to capture directionality in data. This model yields a viable alternative to principal component analysis (PCA) as a dimension reduction tool that favours directions along which the data are most spread out. These theoretical investigations unveil intriguing questions for further examination in random matrix theory, stochastic geometry, and related topics. The results were published in Proceedings of the National Academy of Sciences of the United States of America (June 2020).

#### **Reference:**

S. Ghosh, P. Rigollet. "Gaussian determinantal processes: A new model for directionality in data." Proceedings of the National Academy of Sciences, 117(24) (2020): 13207 – 13213.