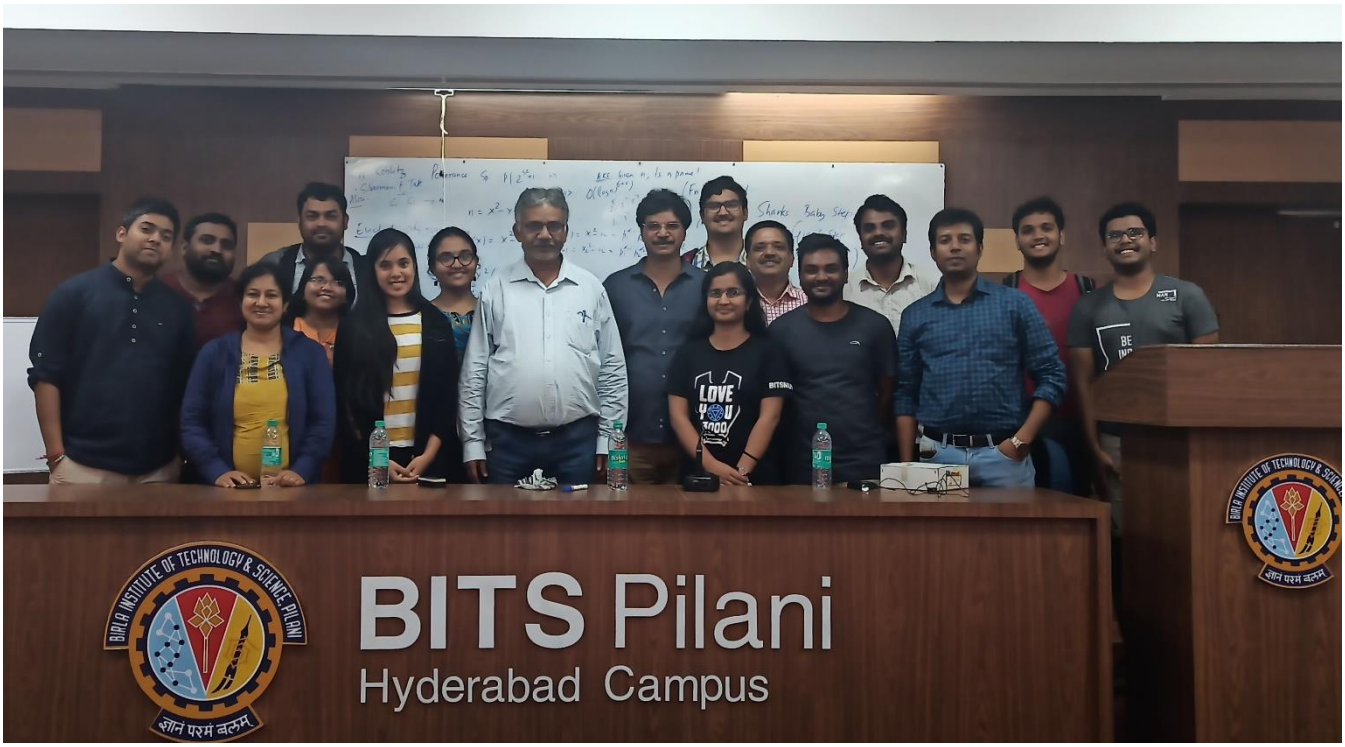
Prof. Srinivas Kotyada, IMSc Chennai delivered a talk on " Number theory and secure communication " on January 09, 2020

Abstract: The public key cryptography aims to address the issues of communicating securely through insecure channels. The security of many of these cryptographic protocols are based on the hardness of solving some number theoretic problems. In his talk, he discussed some popular schemes like RSA, Diffie-Hellman key exchange protocol, ElGamal cryptosystem and the underlying mathematical problems.



Prof. Ashis SenGupta, ISI Kolkata, delivered a talk on ' Statistical Learning for Big Manifold' on January 20, 2020

Abstract: The explosion of Big Data have attracted researchers from almost all areas of Science and Engineering, with a panorama of approaches for solving problems of diverse nature. While fast and soft computations have been of prime concern, Data Science has been demanding scientific and objective analysis. In this backdrop, Statistical Science is playing an indispensible role. In this talk we focus on the three basic V's of Big Data: Variety, Volatility and Volume. In the Variety aspect, we present Manifold data – specifically Directional Data, where observations that can be mapped onto circles and spheres, as in astrophysics, bioinformatics, biomedical (gait analysis) - chemical - mechanical engineering, geosciences, text mining, etc. are considered and corresponding Probability Models are constructed. Volatility is a prime characteristic of modern Big Data, often exhibited through multi-modality but not interpretable by mixture models. We take up the problem of modelling such data next. Volume of data, either in terms of the sheer size or in terms of high-dimensional parameter space with lower dimensional sampling space, i.e. the Large p - Small n case, is a non-trivial problem to analyse. For the former, a hierarchical model-based statistical clustering (unsupervised learning) method is presented. The latter creates the nagging problem of singularity and multi-collinearity. We consider this problem through dimension reduction techniques. Novel approaches of Multivariate Statistical Inference for these problems are also briefly reviewed. Several emerging real-life examples are given to illustrate some of the above methods. It is hoped that this glimpse of the rich arena of scientific challenges and some objective and probabilistic solutions thereto as to be presented in this talk, will encourage the researchers to explore the methods advocated and enhanced through Statistical Science.