

# COLLOQUIUM

**Title: Application of Kullback-Leibler Divergence in one-way ANOVA**

**4-18-19**

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**Time: 3-4:00 pm**

**Place: Neckers 156**

**Reception immediately following in the Math Library.**

Abstract: Kullback-Liebler (KL) divergence, known as relative entropy, is a measure of difference between two probability distributions. The concept was originated in probability theory and information theory, and now widely used in different literature such as data mining, time-series analysis and Bayesian analysis. In this study, we have shown the minimization problem with KL divergence plays a vital part in one-way Analysis of Variance (ANOVA) when comparing means of different groups. As immediate generalization, a new semi-parametric approach is introduced and it can be used for both means and variance comparisons of any type of distributions. The simulation studies show that the proposed method has favorable performance than the classical one-way ANOVA. The method is demonstrated on experimental radar reflectivity data and credit limit data. Asymptotic properties of the proposed estimators are derived with the purpose of developing a new test statistic for testing equality of distributions.