# Analysis Seminar

# A SIMPLE MEASURE OF CONDITIONAL DEPENDENCE

**By**

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**Abstract:** There are numerous problems where one needs to quantify the dependence between two random variables and how this dependence changes by conditioning on a third random variable. Correlated random variables might become independent when we observe a third random variable or two independent random variables might become dependent after conditioning on the third one. Thanks to the wide potential application range e.g., bioinformatics, economics, psychology, etc, finding efficient measures of conditional dependence has been an active area of research in many subareas of statistics and machine learning. However, the literature on measures of conditional dependence is not so large, especially in the non-parametric setting. We introduce two novel measures of conditional dependence and propose estimators based on i.i.d. samples. Using these statistics, we devise a new variable selection algorithm, called Feature Ordering by Conditional Independence (FOCI). FOCI is model-free with no tuning parameters and is provably consistent under sparsity assumptions. We provide a number of example application analyses to both synthetic and real datasets

**Date:** 17 February, 2021
**Time:** 13:30-14:30, GMT+3.
**Place:** ZOOM

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