Statistics Seminar

Department of Mathematics and Statistics

DATE:	Thursday, November 9, 2023
TIME:	1:15pm – 2:15pm
LOCATION:	WH 100E
SPEAKER:	Wang Zhou, Binghamton University
TITLE:	Class-Conditional Conformal Prediction with Many Classes

Abstract

Standard conformal prediction methods provide a marginal coverage guarantee, which means that for a random test point, the conformal prediction set contains the true label with a user-specified probability. In many classification problems, we would like to obtain a stronger guarantee—that for test points of a specific class, the prediction set contains the true label with the same user-chosen probability. For the latter goal, existing conformal prediction methods do not work well when there is a limited amount of labeled data per class, as is often the case in real applications where the number of classes is large. The authors propose a method called clustered conformal prediction that clusters together classes having “similar” conformal scores and performs conformal prediction at the cluster level. Based on empirical evaluation across four image data sets with many (up to 1000) classes, they find that clustered conformal typically outperforms existing methods in terms of class-conditional coverage and set size metrics.