Statistics Seminar

Department of Mathematics and Statistics

DATE:	Thursday, February 15, 2024
TIME:	1:15pm – 2:15pm
LOCATION:	WH 100E
SPEAKER:	Wenshu Dai, Binghamton University
TITLE:	The mixture of logistic t multinomial models (continued)

Abstract

In the context of analyzing complex, high-dimensional microbiome data, the use of Gaussian mixture models is becoming more common. Although applying a multinomial distribution takes into account the compositional nature of the data and a Gaussian prior provides versatility in modeling covariance matrices, it is important to note the potential for heavy-tailed distributions in log-ratio transformed microbiome data. To address this, our research introduces a more resilient model: a mixture of logistic t-multinomial models. This model is designed to work with the hierarchical structures of the log-ratio transformed compositional data, providing a more robust alternative to the normal distribution with longer tails. Additionally, we incorporate a variational Gaussian approximation alongside the Expectation-Maximization (EM) algorithm, which aids in the effective estimation of parameters.