THE UNIVERSITY OF CHICAGO

Computational and Applied Mathematics & Statistics Student Seminar

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Modeling Underdispersion in Matrix Factorization with Poisson Maxima

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ABSTRACT

Poisson factorization is a common and attractive framework to uncover latent structure in non-negative count matrices. One limitation is the inability of the Poisson likelihood to capture conditional over and underdispersion in the data, leading to incorrect intervals for estimated model parameters and potentially misfit underlying structure. While we can extend Poisson Factorization to the overdispersed case through properties that relate the Negative Binomial and Poisson distributions, there is currently no method to model a conditionally underdispersed likelihood in a matrix factorization setting. By leveraging properties of Poisson maxima, we are able to adapt Poisson factorization to the underdispersed case.