Independent Study

Instructor: Patrick Flaherty

Fall 2020

Course Description

The purpose of this independent study is to work on the Beta Tucker decomposition project with Pat Flaherty and Aaron Schein. The student will survey literature related to evaluating representation learning models and develop an evaluation method applicable to the Beta Tucker model.

Objectives

- **Create an annotated bibliography.** For each paper read, cite and write a 3-4 sentence summary. This annotated bibliography should be updated regularly.
- **Develop and implement a method** for evaluating goodness of fit for representation learning models.
- **Contribute to writing** sections of the Schein paper.

Preliminary Bibliography

1. Wu, S., Joseph, A., Hammonds, A.S., Celniker, S.E., Yu, B., and Frise, E. (2016), "Stability-driven nonnegative matrix factorization to interpret spatial gene expression and build local gene networks," *PNAS*, 113, 4290–4295.
2. Schein, A., Flaherty, P., Zhou, M., Sheldon, D., and Wallach, H. (2017), "Count-Randomized Beta Factorization for DNA Methylation Data," *Proceedings of the 34th International Conference on Machine Learning*.
3. Kuan, P.F., Wang, S., Zhou, X., and Chu, H. (2010), "A statistical framework for Illumina DNA methylation arrays," *Bioinformatics*, 26, 2849-2855.
4. Hoff, P.D. (2005), "Bilinear Mixed-Effects Models for Dyadic Data," *Journal of the American Statistical Association*, 100, 286-295.