

Challenges and Directions for Future Research (cont.)

- **Challenge 3: How can we address the problem of multiple local maxima?**
 - All topic models have the problem of multiple local maxima, causing problems with reproducing results
 - Need to compute the variance of a discovered topic
 - Need to define and report the confidence interval for a topic
- **Challenge 4: How can we develop efficient estimation and inference algorithms for sophisticated models?**
 - How can we leverage a user's knowledge to speed up inferences for topic models?
 - Need to develop parallel estimation/inference algorithms