5. Summary

Summary

- Unsupervised parsing aims to learn a parser without annotated data
- Two classes of approaches
  - Generative approaches model the joint probability of the sentence and the corresponding parse tree.
    - Structure learning, parameter learning
  - Discriminative approaches model the conditional probability or score of the parse tree given the sentence.
    - Autoencoder, VAE, etc.
- Special topics
  - Lexicalized grammars, multimodal learning, language model w/ structural constraints, syntax probes, multilingual learning

Future Directions

- Methodology
  - Combining symbolic/statistical/neural approaches
    - Neural methods do not necessarily outperform old symbolic/statistical methods (Li et al., 2020b)
  - Bigger data, bigger model (Pate & Johnson, 2016; Han et al., 2017)
  - More integration with pretrained contextual embeddings (Jin et al., 2019)
  - Draw inspirations from cognitive science

Future Directions

- Applications/Extensions
  - More applications in downstream tasks
  - Extensions to semi-supervised and transfer learning of syntactic parsers
    - More practically useful than purely unsupervised learning
  - Extensions beyond syntactic parsing to other NLP tasks that can benefit from implicitly learned structures
  - Extensions beyond NLP to other fields
    - Ex: image parsing (Tu et al., 2013), probabilistic modeling (Poon & Domingos, 2011)

Thank you!

Website (slides, references)
https://github.com/tukw/unsupervised-parsing-tutorial