NMT(选读)

神经机器翻译

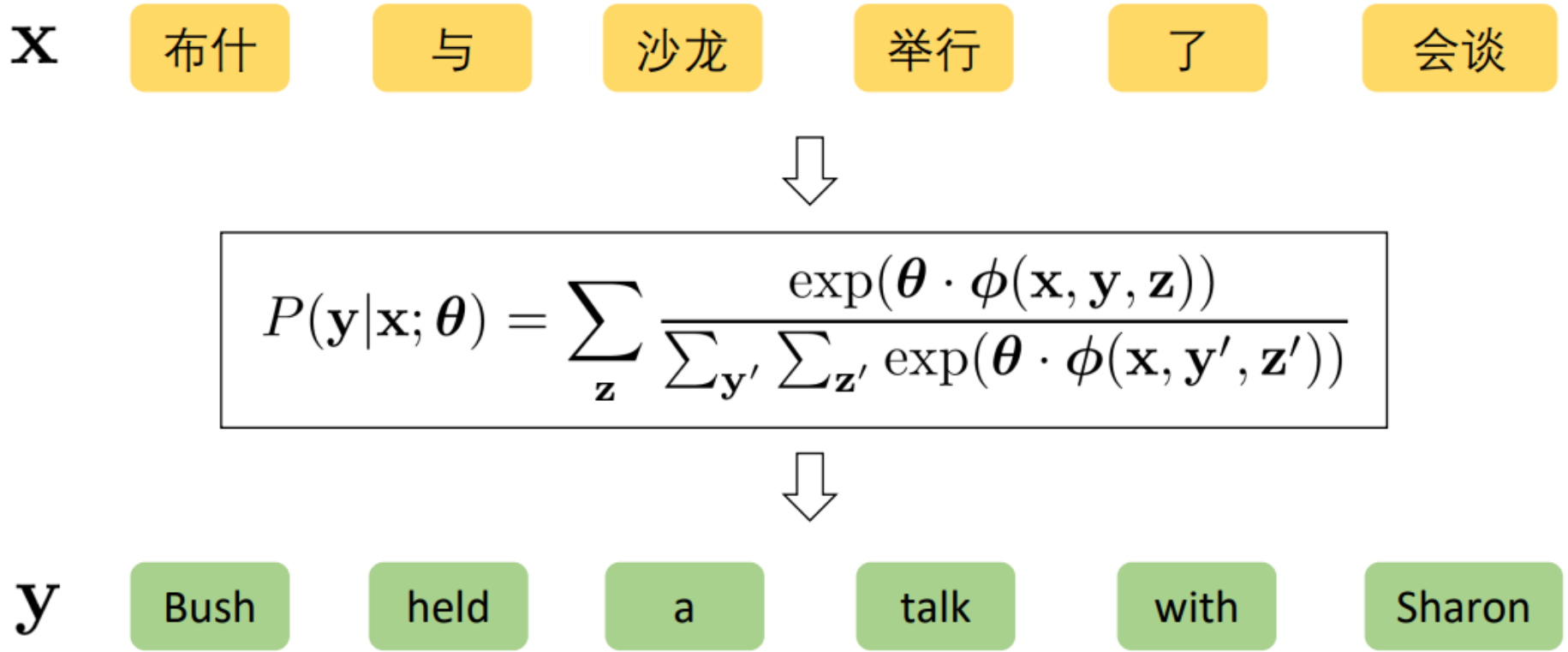
- 从统计机器翻译到神经机器翻译
- 基于编码器-解码器结构的神经机器翻译模型
  - 编码器-解码器结构
  - 注意力机制
- 前沿的神经机器翻译模型
  - 完全基于注意力机制的神经机器翻译模型

神经机器翻译

- 为什么会出现神经机器翻译
  - 统计机器翻译系统需要人工设计特征
  - 难以人为设计出好的特征
  - 深度学习的出现.....
- 端到端的神经机器翻译模型
  - 无需人为设计特征
  - 端到端的翻译模型

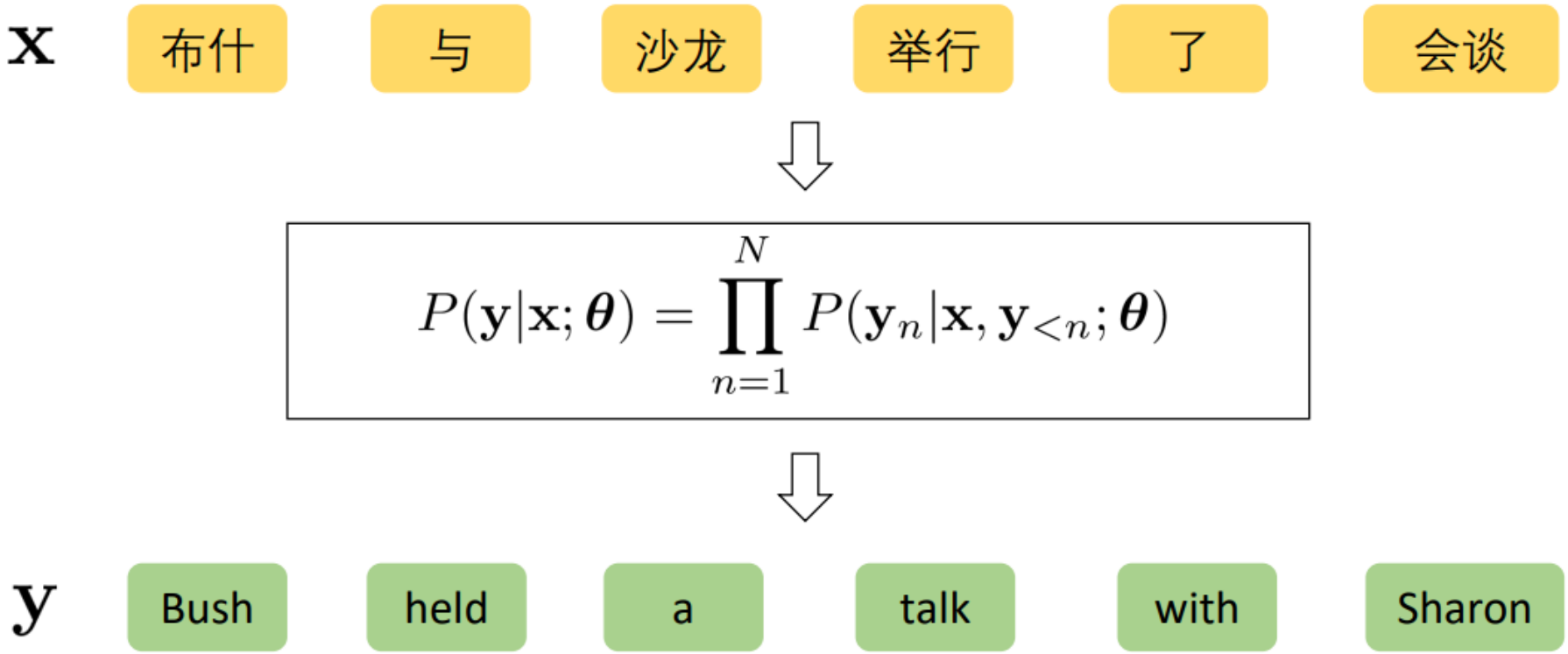
统计机器翻译模型

- 隐变量对数线性模型：在隐式语言结构上设计特征



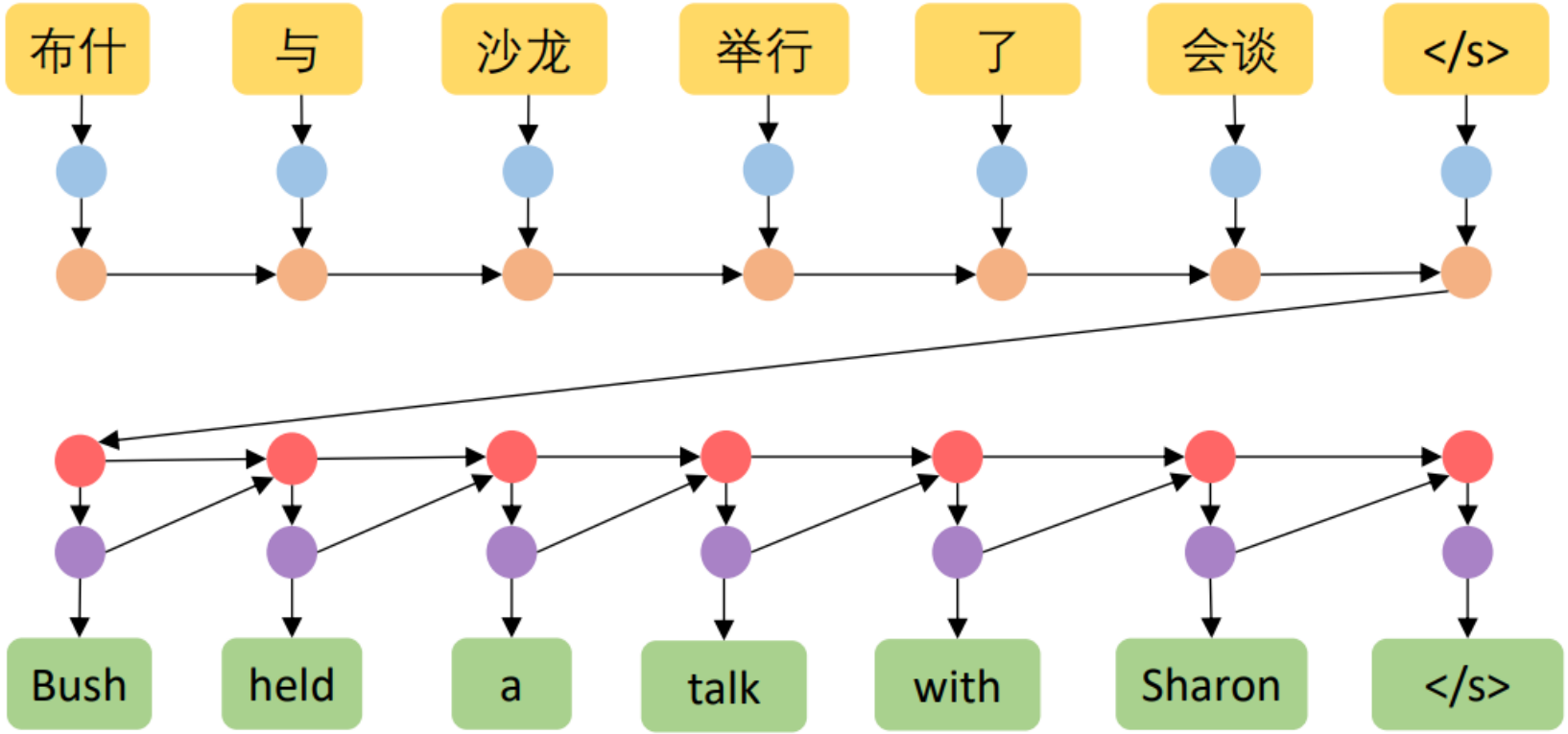
神经机器翻译模型

- 利用神经网络以端到端的方式实现自然语言之间的映射



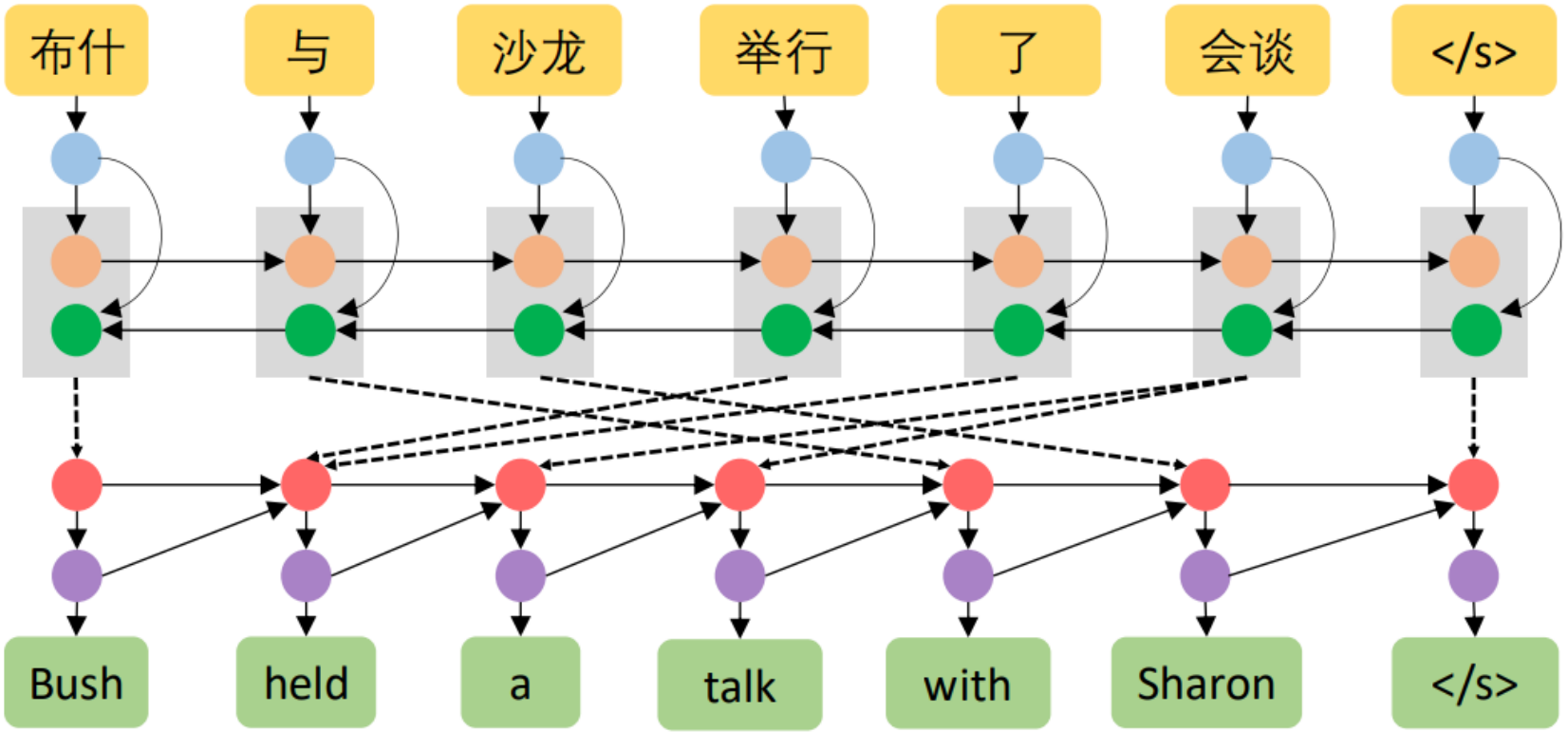
编码器-解码器框架

- 利用递归神经网络实现源语言的编码和目标语言的解码



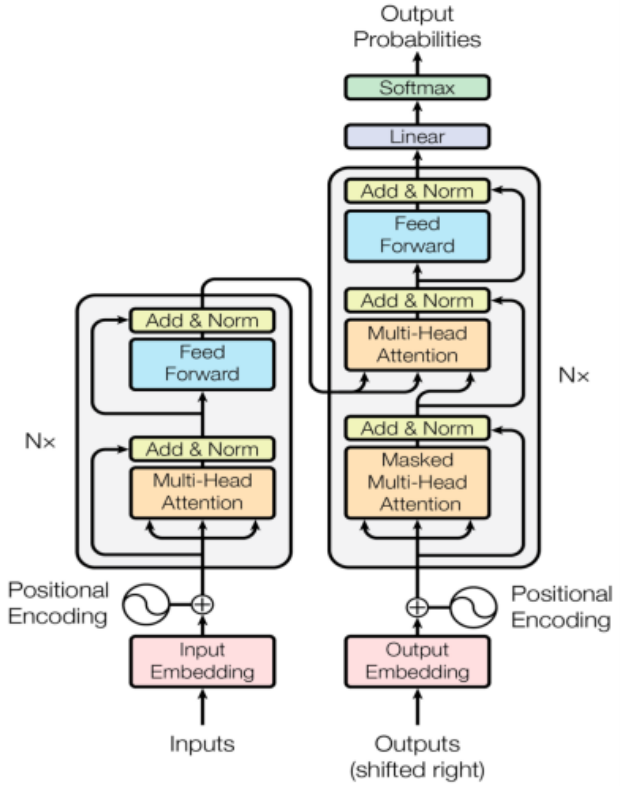
基于注意力机制的神经机器翻译模型

- 利用注意力机制动态计算源语言端相关上下文



完全基于注意力机制的神经机器翻译模型

- 利用注意力机制建立编码器、解码器及其关联



Model	BLEU	
	EN-DE	EN-FR
ByteNet [17]	23.75	
Deep-Att + PosUnk [37]		39.2
GNMT + RL [36]	24.6	39.92
ConvS2S [9]	25.16	40.46
MoE [31]	26.03	40.56
Deep-Att + PosUnk Ensemble [37]		40.4
GNMT + RL Ensemble [36]	26.30	41.16
ConvS2S Ensemble [9]	26.36	**41.29**
Transformer (base model)	27.3	38.1
Transformer (big)	**28.4**	**41.0**

(Vaswani et al., 2017)

延伸阅读列表

- Sequence to Sequence Learning with Neural Networks. Ilya Sutskever, Oriol Vinyals, and Quoc V. Le. In Proceedings of NIPS.
- Neural Machine Translation by Jointly Learning to Align and Translate. Dzmitry Bahdanau, Kyunghyun Cho, and Yoshua Bengio. In Proceedings of ICLR.
- Convolutional Sequence to Sequence Learning. Jonas Gehring, Michael Auli, David Grangier, Denis Yarats, Yann N. Dauphin.
- Effective Approaches to Attention-based Neural Machine Translation. Minh-Thang Luong Hieu Pham Christopher D. Manning. In Proceedings of EMNLP.
- Minimum Risk Training for Neural Machine Translation. Shiqi Shen, Yong Cheng, Zhongjun He, Wei He, Hua Wu, Maosong Sun, and Yang Liu. In Proceedings of ACL.

延伸阅读列表

- Neural Machine Translation of Rare Words with Subword Units. Rico Sennrich, Barry Haddow, and Alexandra Birch. In Proceedings of ACL.
- Visualizing and Understanding Neural Machine Translation. Yanzhuo Ding, Yang Liu, Huanbo Luan, Maosong Sun. In Proceedings of ACL 2017.
- Semi-Supervised Learning for Neural Machine Translation. Yong Cheng, Wei Xu, Zhongjun He, Wei He, Hua Wu, Maosong Sun, and Yang Liu. In Proceedings of ACL.
- Addressing the Rare Word Problem in Neural Machine Translation. Minh-Thang Luong, Ilya Sutskever, Quoc V. Le, Oriol Vinyals, Wojciech Zaremba. In Proceedings of ACL.
- Neural Machine Translation with Pivot Languages. Yong Cheng, Yang Liu, Qian Yang, Maosong Sun, Wei Xu. arXiv:1611.04928.