

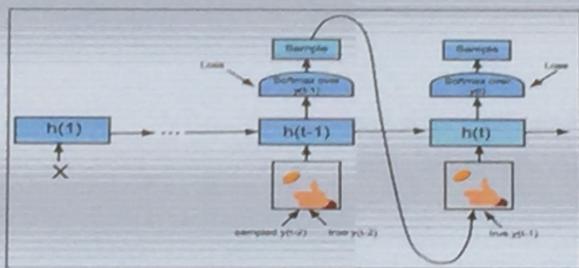
Deep Text Generative Model

- ▶ Autoregressive Model
- ▶ Maximum Likelihood Estimation
- ▶ Generative Adversarial Network
- ▶ Inverse Reinforcement Learning

Maximum Likelihood Estimation Based Models: Schedule Sampling



- ▶ Gently Change the training from using the true previous token to the generated token



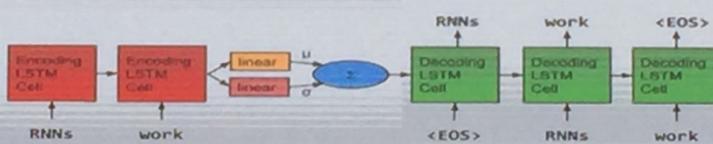
Scheduled Sampling for Sequence Prediction with Recurrent Neural Networks NIPS 2014

陈天奇 (清华大学)

Maximum Likelihood Estimation Based Models: Variational Autoencoder



- ▶ It incorporates distributed latent representations of entire sentences



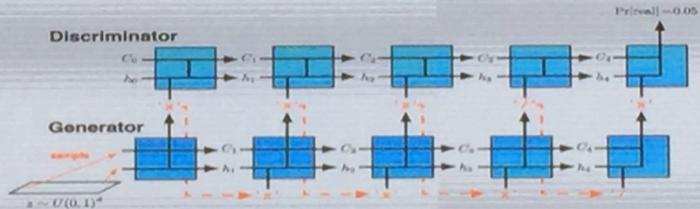
Generating Sentences from a Continuous Space CONLL 2016

陈天奇 (清华大学) 文本生成

Generative Adversarial Network Based Models: Gumbel-softmax GAN



- Gumbel-softmax distribution used for differentiable approximation

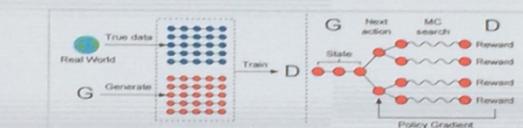


GANS for Sequences of Discrete Elements with the Gumbel-softmax Distribution

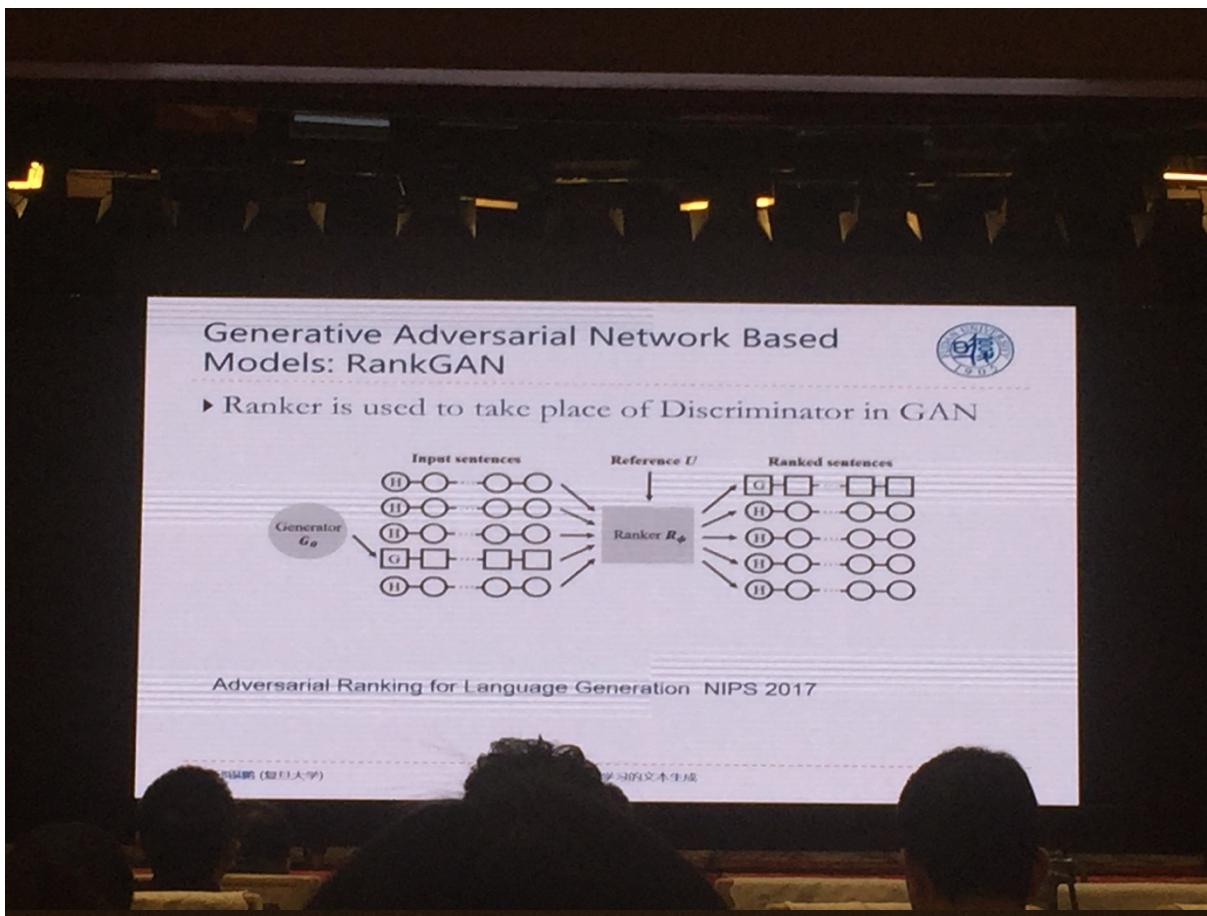
Generative Adversarial Network Based Models: SeqGAN

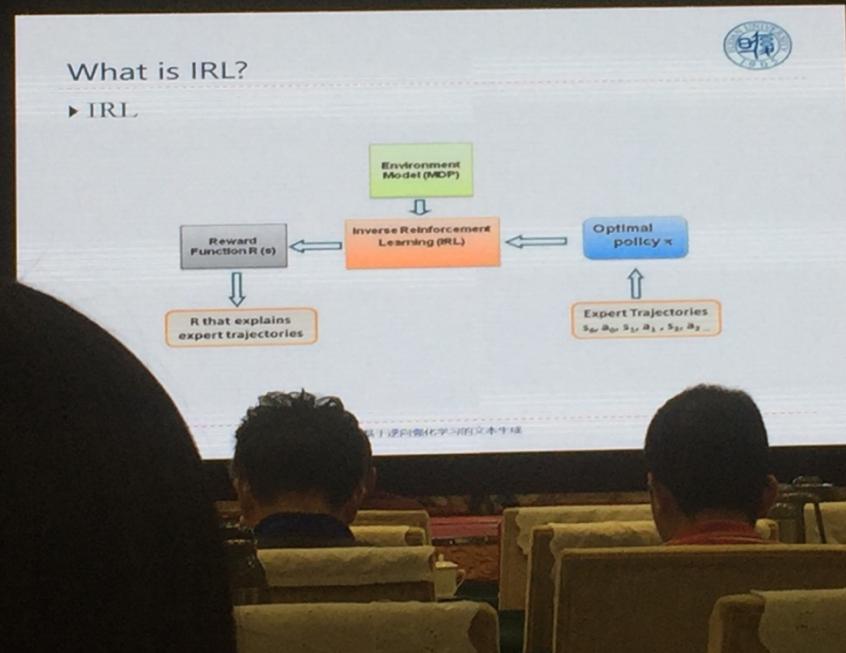
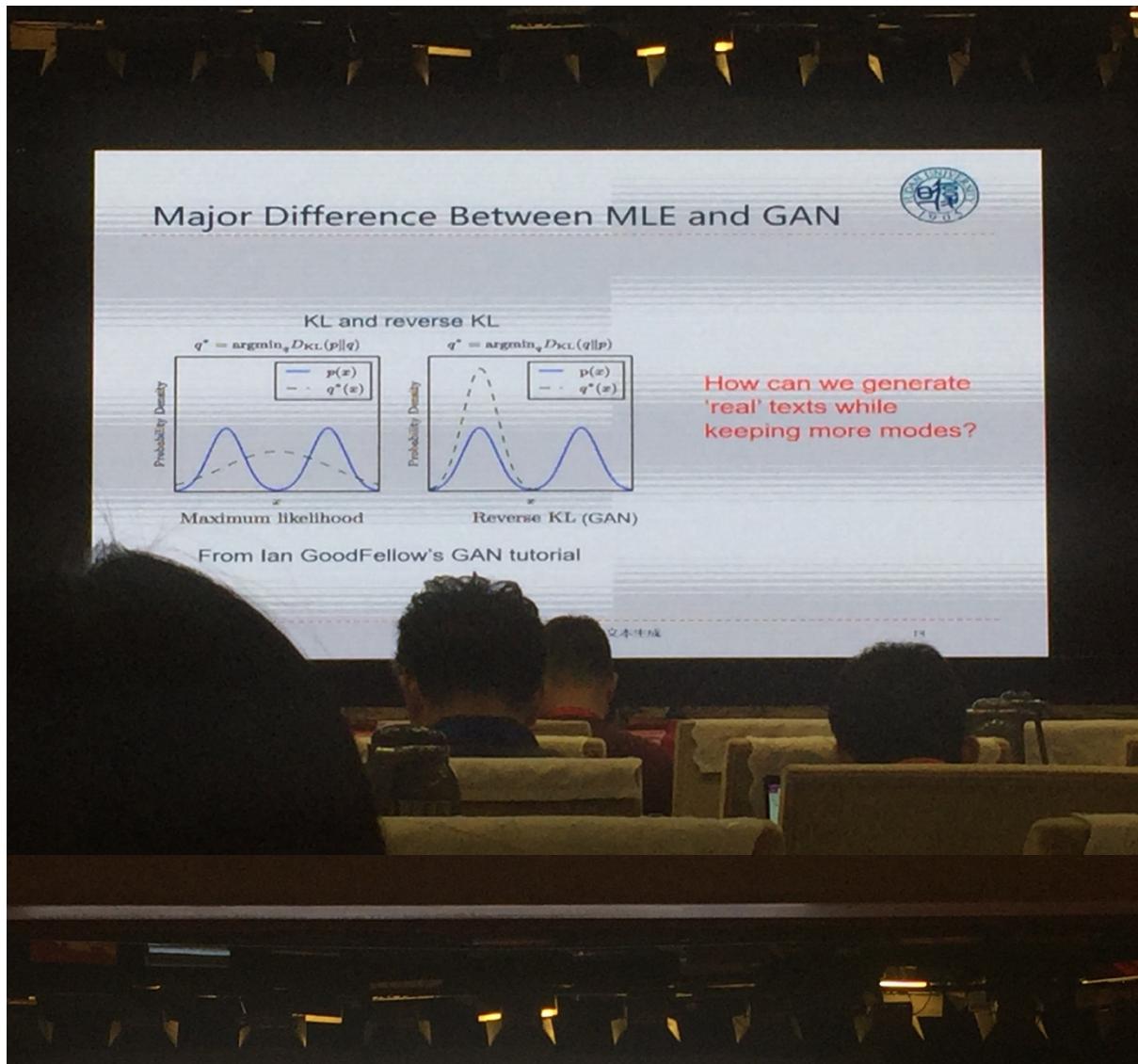


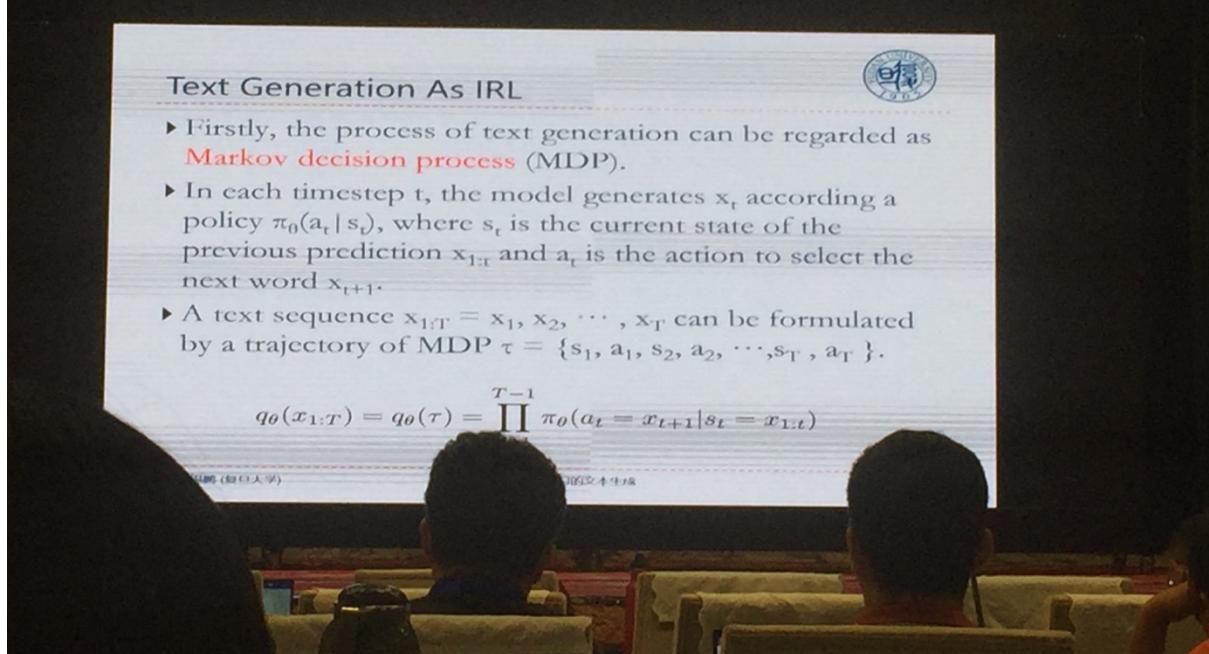
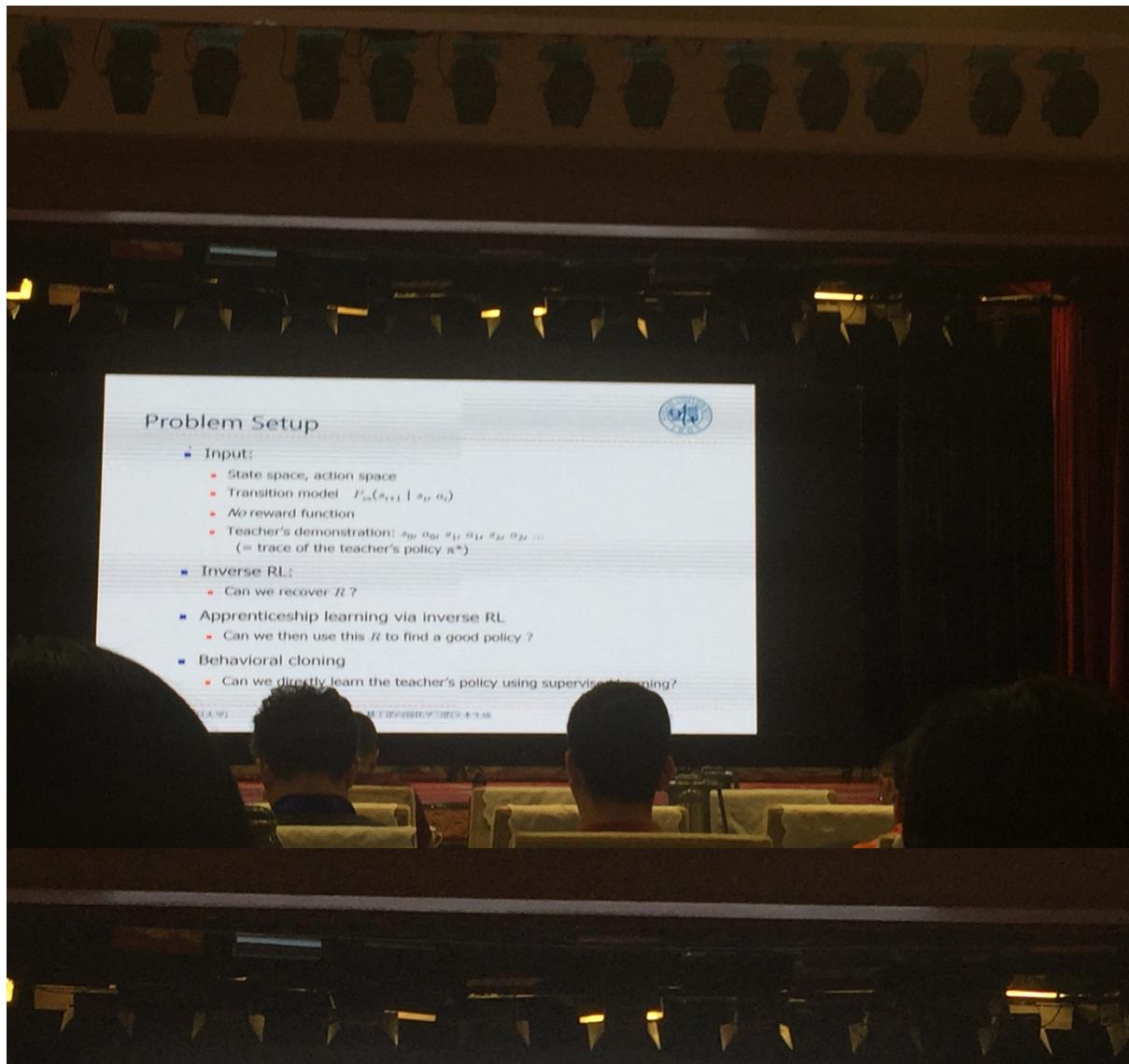
- Reinforcement Learning applied in addressing gradient propagation

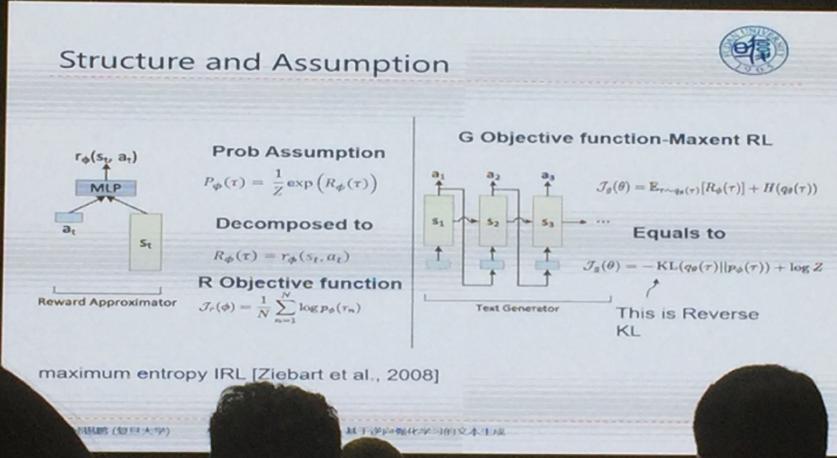
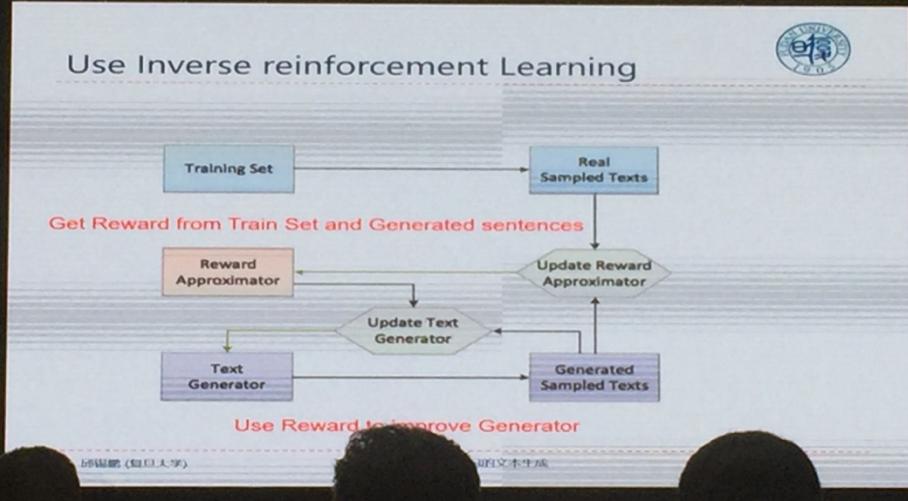


SeqGAN: Sequence Generative Adversarial Nets with Policy Gradient
AAAI 2017





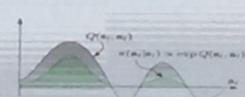
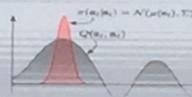




Analysis-Why Can IRL Alleviate Mode Collapse?



- A soft data distribution assumption
 - Max-entropy RL
 - It seeks for multimodal policy distribution.



- GAN: $KL(q_\theta(\tau) || P_{data})$
- IRL: $KL(q_\theta(\tau) || P_\phi(\tau))$
- Since $P_\phi(\tau)$ never equals to zero due to its assumption, IRL can alleviate the model collapse problem in GANs

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自然语言处理与机器翻译

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Summary



- Advantages of IRL based Text Generation

- Get reward signal in each generation step
- Alleviate Mode Collapse thus improve diversity

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