Wangchunshu Zhou

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Education

- **Beihang University** — **Beijing, China**
  Master in Computer Science — *Sep. 2018 - Jan. 2021 (Expected)*
  Advisor: Prof. Ke Xu
- **Beihang University** — **Beijing, China**
  B.S. in Information and Computing Science (Sino-French Engineering School) — *Sep. 2014 - Jul. 2018*

Research Interest

My research interests include Deep Learning in NLP. Some of my primary research interest including (Pretrained) Language Modeling, Transfer Learning, Commonsense Reasoning, Reinforcement Learning, Generative Adversarial Nets, and their application in Natural Language Generation.

I am also interested in building efficient NLP models through knowledge distillation, meta learning, or active learning. I am also fascinated by the idea of learning through natural language, such as Emergent Communication in Multi-agent Reinforcement Learning and learning from natural language explanations.

Publications

- (*Under Review*) **Compressing BERT by Progressive Module Replacing**
  - Canwen Xu*, *Wangchunshu Zhou**(*equal contribution*), Tao Ge, Ke Xu.
  - *Submitted* to the Thirty-seventh International Conference on Machine Learning. (ICML, 2020)
  - We propose a novel model compression approach that progressively replace each component in an large model by smaller modules. We apply our proposed approach to compress BERT and achieved state-of-the-art performance in comparable settings.
- (*Under Review*) **Improving Grammatical Error Correction with Machine Translation Pairs.**
  - *Wangchunshu Zhou*, Tao Ge, Chang Mu Ke Xu, Furu Wei, Ming Zhou.
  - *Submitted* to The 2020 Conference on Empirical Methods in Natural Language Processing (EMNLP, 2020)
  - We propose to use a pair of Machine Translation models with different qualities to synthesize pseudo-parallel data for pretraining Grammatical Error Correction models.
- (*Under Review*) **Hierarchical Summary to Article Generation.**
  - *Wangchunshu Zhou*, Tao Ge, Ke Xu, Furu Wei, Ming Zhou.
  - *Submitted* to The 2020 Conference on Empirical Methods in Natural Language Processing (EMNLP, 2020)
  - We introduce a hierarchical model to generate long articles based on short summaries by first generating sketches in an intermediate length, and propose techniques to bridge the gap between training and inference of the model and a novel evaluation metric for conditional long text generation tasks.
- (*Under Review*) **Scheduled DropHead: A Regularization Method for Transformer Models.**
  - *Wangchunshu Zhou*, Tao Ge, Ke Xu, Furu Wei, Ming Zhou.
  - *Submitted* to The 2020 Conference on Empirical Methods in Natural Language Processing (EMNLP, 2020)
  - We introduce DropHead, a structured dropout mechanism for the multi-head attention mechanism in the transformer models, and a specifically designed dropout rate schedule for DropHead.
- **Self-Adversarial Learning with Comparative Discrimination for Text Generation.**
  - *Wangchunshu Zhou*, Tao Ge, Ke Xu, Furu Wei, Ming Zhou.
  - The Eighth International Conference on Learning Representations. (ICLR, 2020)
  - We propose to integrate the self-play mechanism, which is commonly used in the RL community, into training of GANs to reduce the reward sparsity and mode collapse problem and make training more stable.
- **Learning to Compare for Better Training and Evaluation of Open Domain Text Generation Models.**
  - *Wangchunshu Zhou*, Ke Xu.
  - The Thirty-Fourth AAAI Conference on Artificial Intelligence (AAAI, 2020) (Oral).
  - We proposed a novel "Learning to Compare" paradigm and employ the skill rating system, which is commonly used to evaluate human chess players' skill, to evaluate the performance of open domain text generation systems.
- **BERT-based Lexical Substitution.**
  - *Wangchunshu Zhou*, Tao Ge, Ke Xu, Furu Wei, Ming Zhou.
  - The 57th annual meeting of the Association for Computational Linguistics. (ACL, 2019)
  - We proposed a novel lexical substitution based on pretrained masked lanuage models (e.g. BERT) to automatically propose substitute candidates and rank them without relying on external lexical resources.

Research Experiences

- **Research Intern at Microsoft Research Asia** — **Beijing, China**
  Natural Language Computing Group, Mentor: Dr. Tao Ge — *Dec. 2018 - Present*
  Working on Natural Language Generation (NLG).
- **Research Student at NLSDE Lab** — **Beijing, China**
  Natural Language Processing Group, Advisor: Prof. Ke Xu — *Aug. 2018 - Present*
  Working on Natural Language Generation (NLG).

Services

- Reviewer: NeurIPS 2020
- Student Volunteer: ACL 2019
- Review Assistant: EMNLP 2019, ACL 2020

Honors and Awards

- Student Travel Grant: AAAI 2020, ICLR 2020
- Scholarship of Academic Excellence (Master), Beihang University. 2018, 2019 (top 15%)
- The CASC Award, Beihang University. 2017 (top 3)
- Scholarship of Academic Excellence (Bachelor), Beihang University. 2016, 2017 (top 20%)