



XIANGYU (BECKY) PENG

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Research area: Natural Language Generation, Reinforcement Learning,
Knowledge Graph, Game AI, Deep Learning

EDUCATION

Georgia Institute of Technology , Atlanta, GA, US Aug 2019 - Present
Ph.D. in Machine Learning, GPA: 4.00/4.00, Advisor: Dr. Mark O. Riedl

Stanford University , Stanford, CA, US Sep 2017 - Jun 2019
M.S. in Structure Engineering, GPA: 4.00/4.30, Advisor: Dr. Jack Baker
Relevant Coursework: Deep Learning; Convolutional Neural Networks for Visual Recognition; Machine Learning; Data Mining and Analysis; Mining Massive Data Sets

Shanghai Jiaotong University , Shanghai, China Sep 2013 - Jun 2017
B.S. in Civil Engineering, GPA: 3.95/4.00, Advisor: Dr. Lulu Zhang
Relevant Coursework: Data structure; Programming Abstractions in C++

SELECTED WORK EXPERIENCE

Research Scientist Intern May 2023 - Present
NLP Group, Microsoft Research, mentor: Sudha Rao, Bill Dolan Redmond, WA

- Design a role-playing text adventure game with multiple NPCs with TextWorld and **GPT-4**
- Proposing a novel architecture to apply GPT-4 on **Game user experience** analysis and improvement

Research Scientist Intern May 2022 - Nov 2022
Interactive AI Team, Salesforce Research, mentor: Chen Xing, Prafulla Choubey Palo Alto, CA

- Proposing a sample-specific ensemble of source models (SESoM) for **few-shot prompt-tuning**, which properly **transfers knowledge** from **trained soft prompts of source task** in large language models
- SESoM learns from the few-shot target samples to adaptively decide how much each source task should contribute given different target samples by calculating **attentions** between samples and pre-trained prompts

Data Scientist Intern May 2021 - Aug 2021
Commerce Cloud team, Salesforce, mentor: Michael Sollami, Keld Lundgaard Boston, MA

- Proposing an effective architecture, Extract-Boost-Finetune (XFBoost), for **improving the quality of automatic product description generation** given images and product name
- Enhancing product description generation by extracting attributes from product images and increasing the likelihood of tokens matching extracted features
- Fine-tuning product description generation model with reinforcement learning using a secondary language model trained on human preferences as the reward model to improve description quality

PUBLICATIONS

[11] **Story Shaping: Teaching Agents Human-like Behavior with Stories**
Xiangyu Peng, Christopher Cui, Wei Zhou, Renee Jia, Mark Riedl
Under Review

[10] **Neuro-Symbolic World Models for Adapting to Open World Novelty**

Jonathan Balloch, Zhiyu Lin, Robert Wright, Xiangyu Peng, Mustafa Hussain, Aarun Srinivas, Julia Kim, Mark O. Riedl

Under Review

[9] **Model ensemble instead of prompt fusion: a sample-specific knowledge transfer method for few-shot prompt tuning**

Xiangyu Peng, Chen Xing, Prafulla Kumar Choubey, Chien-Sheng Wu, Caiming Xiong

Proceedings of the 11th International Conference on Learning Representations (ICLR-23)

[8] **Inherently Explainable Reinforcement Learning in Natural Language**

Xiangyu Peng, Mark Riedl, Prithviraj Ammanabrolu

Proceedings of the 36th Conference on Neural Information Processing Systems (NeurIPS-22)

[7] **Guiding Neural Story Generation with Reader Models**

Xiangyu Peng, Kaige Xie, Amal Alabdulkarim, Harshith Kayam, Samihan Dani and Mark Riedl

Findings of the Association for Computational Linguistics: EMNLP 2022

[6] **Inferring the Reader: Guiding Automated Story Generation with Commonsense Reasoning**

Xiangyu Peng, Siyan Li, Sarah Wiegrefe and Mark Riedl

Findings of the Association for Computational Linguistics: EMNLP 2022

[5] **NovGrid: A Flexible Grid World for Evaluating Agent Response to Novelty.**

Jonathan Balloch, Zhiyu Lin, Mustafa Hussain, Aarun Srinivas, Robert Wright, Xiangyu Peng, Julia Kim, and Mark Riedl.

AAAI 2022 Spring Symposium on Designing Artificial Intelligence for Open Worlds.

[4] **XFBoost: Improving Text Generation with Controllable Decoders**

Xiangyu Peng and Michael Sollami

Under Review.

[3] **Detecting and Adapting to Novelty in Games**

Xiangyu Peng, Jonathan Balloch and Mark Riedl

Creativity and Robotics at ICSR 2020||Reinforcement Learning in Games workshop at AAAI 2021

[2] **Automatic Story Generation: Challenges and Attempts**

Amal Alabdulkarim, Siyan Li and Xiangyu Peng

The 3rd Workshop On Narrative Understanding in NAACL-21

[1] **Reducing Non-Normative Text Generation from Language Models**

Xiangyu Peng, Siyan Li, Spencer Frazier and Mark Riedl

Oral. Proceedings of the 13th International Conference on Natural Language Generation (INLG-20)

SKILLS

Technical: Natural Language Processing, Large Language Model, Prompt Tuning/Engineering, Reinforcement Learning, Game AI, Explainable AI, Machine Learning, Computer Vision

Programming: C/C++, Python, R, SQL, MATLAB, Julia

Tools and Framework: OpenAI, PyTorch, Tensorflow, Git, scikit-learn, Numpy, Pandas, nltk, AWS