

Shengguang (Daniel) Wu

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EDUCATION

- Peking University** Sept. 2021 - Jun. 2024
Institute of Applied Linguistics - Natural Language Processing **Master**
▷ Key Courses: computational linguistics, data structures, data mining and analysis, corpus linguistics
- School of Computer Science - Computer Intelligence* **Graduate-Level Curriculum**
▷ Key Courses: multimodal learning (language and vision), semantic computation, knowledge retrieval
- LMU Munich** Sept. 2019 - Aug. 2020
School of Language and Literature - Linguistics **Exchange Funded by National Scholarship**
▷ Key Courses: language and cognition, generative syntax, distributed morphology, lexicology
- Nanjing University** Sept. 2017 - Jun. 2021
Department of German Studies - Germanic Linguistics **Bachelor**
▷ Key Courses: syntactic parsing, pragmatics

RESEARCH INTERESTS

- LLM&VLM:** interactive agents, lifelong/continual learning, multimodal grounding & reasoning
NLG&AIGC: controlled text/visual generation (creativity, coherency, narrative), diffusion models,
NLP+: LM + linguistic insights, LM + cognition, applications for social good
Efficiency: data-centric active learning, knowledge distillation

PUBLICATIONS

- Shengguang Wu**, Mei Yuan, Qi Su. (in *EMNLP-2023-Findings*). “DiffuVST: Narrating Fictional Scenes with Global-History-Guided Denoising Models.” [\[PDF\]](#)
- Shengguang Wu**, Keming Lu, Benfeng Xu, Junyang Lin, Qi Su, Chang Zhou. (submitted to *NAACL-2024*, on *ArXiv-2023*). “DiverseEvol: Self-Evolved Diverse Sampling for Efficient Instruction Tuning.” [\[PDF\]](#)
- Shengguang Wu**, Zhenglun Chen, Qi Su. (submitted to *ECCV-2024*, on *ArXiv-2023*). “Knowledge-Aware Artifact Image Synthesis with LLM-Enhanced Prompting and Multi-Source Supervision.” [\[PDF\]](#)
- Jinze Bai, ..., **Shengguang Wu**, ..., Tianhang Zhu et al. (on *ArXiv-2023*). “Qwen Technical Report.” [\[PDF\]](#)
- Shengguang Wu**, Lingling Chang. (in *Language, Technology and Culture, 2022*, pp. 241-256). “Complex PATH-Constructions in German and Chinese: An Investigation of Their Cognitive Basis and Derivation Structure from a Neo-Constructionist Grammar Perspective. [title translated from German].” [\[BOOK\]](#)

RESEARCH EXPERIENCE

- Institute for Artificial Intelligence, Peking University** Nov. 2021 - present
Research Assistant in NLP and Multimodality mentored by [Prof. Qi Su](#)
- ⊗ **Diffusion-Based Visual Storytelling with Global Guidance:** Proposed an extended DiffusionLM featuring bidirectional textual history guidance and multimodal adapters to generate a coherent story that narrates a sequence of images. → Superior performance across NLG metrics at a massively faster inference speed compared to strong baselines. ([PAPER](#), published in *EMNLP-2023-Findings*).
 - ⊗ **Knowledge-Aware Artifact Image Synthesis with LLM-Enhanced Prompting and Multi-Source Supervision:** Proposed an artifact image recovery system that accurately generates images of lost artifacts adhering to historical knowledge. → Significant improvement across automatic metrics and in human evaluation. ([PAPER](#), submitted to *IJCAI-2024*; on *ArXiv-2023*).

- ⊛ **Advancing Pragmatic Interactions with LLMs:** Introduced an in-depth analysis of conversational implicatures within LLMs, followed by strategic enhancements in alignment-tuning and inference to elevate their pragmatic understanding and response mechanisms. ↦ More human-like conversational interactions due to the model's refined grasp of pragmatics. ([technical paper in progress](#)).
- ⊛ **Enhancing Logic Puzzle Solving via Graph-Guided LLM Agent:** Proposed a graph-structured system to search for the optimal path linking diverse intermediate reasoning steps toward solving a logic puzzle. ↦ Substantial accuracy boost over baseline LLM on logic puzzle problems. ([technical paper in progress](#)).

DAMO Academy, Alibaba Inc.

Research Intern in Foundation LLM - Qwen Team

Mar. 2023 - present

mentored by [Junyang Lin](#)

- ⊛ **Self-Evolving Diverse Sampling for Efficient Instruction Tuning:** Proposed an iterative sampling system based on diversity measures to select the most effective instruction data that continuously improves model capability without any external supervision. ↦ Superior performance with **less than 8%** of the original data size across various source datasets and multiple benchmarks. ([PAPER](#), submitted to [NAACL-2024](#); on [ArXiv-2023](#)).
- ⊛ **Large-Scale Supervised Finetuning (SFT) with MoE for Human-Alignment:** Collaboratively applied large-scale SFT to cover highly diverse user queries. ↦ Routinely updated our foundation LLM's dialogue ability to meet user expectations and achieve superior performance across benchmarks. ([PAPER](#), on [ArXiv-2023](#), open-sourced version: [Qwen\(-Chat\)](#)).

AI-Lab NLP&Research, ByteDance (TikTok) Inc.

Research&Development Intern in NLP

Jul. 2022 - Feb. 2023

mentored by Runkai Yang and [Dr. Yuan Lin](#)

- ⊛ **Fine-Grained NLI System with Mixture of Experts (MoE):** Built a fine-grained rumor & harmful-message detection pipeline with multi-level multi-label NLI model and mixture of problem-tag experts (MoE) deployed on multiple company apps (TikTok, Toutiao, etc.). ↦ Achieved a gain of **5%-20%** in precision rate.
- ⊛ **Deep Active Learning:** Proposed deep active learning strategies based on predictive uncertainty and clustering to iteratively reduce data-labeling labor for model update. ↦ Reduced training data size by **60%-70%** in NLI training for similar/better performance.

OTHER RESEARCH PROJECTS

- ⊛ **User-Controllable Diverse Image Captioning:** Proposed a user-controllable image captioner based on FasterRCNN&BottomTopLSTM by explicitly fusing encoded macro-textual attributes into the decoder. ↦ Better performance across metrics on COCO-Caption, while allowing diverse user-control of caption texts. (Jan. 2022)
- ⊛ **Archaic↔Modern Chinese Unsupervised Machine Translation:** Proposed a fully unsupervised translation model between archaic and modern Chinese with a shared bilingual encoder and two language-specific decoders trained by denoising and backtranslation. (Dec. 2021)

SKILLS

Languages

Mandarin Chinese:	native
English:	TOEFL-iBT: 118 (R30/L30/S30/W28) ; IELTS: 8.0 (S8.0)
German:	TestDaf: 100% full marks (TDN5)

Programming

Python, SQL, HTML.	Docker, Git, Linux, MacOS, Windows.
PyTorch, Megatron, Deepspeed.	Scikit-Learn, Numpy, SciPy, Pandas, NLTK, SpaCy.

AWARDS AND SCHOLARSHIPS

First Prize for Outstanding Bachelor Thesis Award, <i>Nanjing University</i>	Jun. 2021
Outstanding Student Leader Award, <i>Nanjing University</i>	Dec. 2018
National Scholarship for International Exchange, <i>CSC</i>	Sept. 2019 - Aug. 2020