# ZONGYU GUO

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Full of curiosity at the age of 25
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## EDUCATION

**Visiting Student** | **University of Cambridge** — Oct. 2022 – Sept. 2023
Machine Learning Group, Computational and Biological Learning Lab — Cambridge, UK

**Ph.D.** | **University of Science and Technology of China (USTC)** — Sept. 2019 – June 2024
Information and Communication Engineering — Hefei, China

**Bachelor** | **University of Science and Technology of China (USTC)** — Sept. 2015 – June 2019
Electronic Engineering and Information Science — Hefei, China

## IMPORTANT EXPERIENCE

- I'm a PhD candidate at the University of Science and Technology of China (USTC) supervised by Prof. Zhibo Chen <**homepage**>/<**scholar**>. I am expected to receive my PhD degree in June, 2024.
- I was a visiting student at the machine learning group of the computational and biological learning lab, University of Cambridge, advised by Prof. José Miguel Hernández-Lobato <**homepage**>/<**scholar**>, funded by the outstanding PhD program in USTC. I started remote collaboration with Miguel from Oct. 2022 to Feb. 2023 and I had an in-person visit from Mar. 2023 to Sept. 2023.
- I had an internship in Microsoft Research Asia (MSRA) in the intelligent multimedia (IM) group, working together with mentor Cuiling Lan <**scholar**>, from Dec. 2021 to Dec. 2022.

## RESEARCH

As a researcher in machine learning, I have been focused on developing effective and practical methods for **neural compression** from the view of **probabilistic generative models**.

My knowledge and interest span multiple areas, including **implicit neural representations** for **multi-modality data**, and **probabilistic generative models**, including VAEs, normalizing flows, autoregressive models and diffusion models. Recognizing that probabilistic generative models can also function as compression models, I possess a comprehensive understanding of the aforementioned generative models, particularly from a theoretical perspective.

I am actively looking for a position in AI research, not limited to the topics of neural compression, probabilistic generative models and the applications of LLMs with multi-modality data.

## SELECTED PUBLICATIONS

Full paper list can be found in my google scholar page <**scholar**>. Over 450 citations, Aug 2023.

Conferences:

- **Zongyu Guo**#, Gergely Flamich#, Jiajun He, Zhibo Chen, José Miguel Hernández-Lobato. "Compression with Bayesian Implicit Neural Representations". **NeurIPS 2023** submission. Post-rebuttal scores are 87765.

- **Zongyu Guo**, Cuiling Lan, Zhizheng Zhang, Yan Lu, Zhibo Chen*. "Versatile Neural Process for Learning Implicit Neural Representation". In *Proceedings of the 11th International Conference on Representation Learning*, 2021. (**ICLR 2023**). TLDR: A general generative model for multi-modality data.
- Runsen Feng, **Zongyu Guo**, Weiping Li, Zhibo Chen*. "NVTC: Nonlinear Vector Transform Coding". In *Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition*, 2023. (**CVPR 2023**).
- **Zongyu Guo**, Zhizheng Zhang, Runsen Feng, Zhibo Chen*. "Soft then Hard: Rethinking the Quantization in Neural Image Compression". In *Proceedings of the 38th International Conference on Machine Learning*, 2021. (**ICML 2021**).
- **Zongyu Guo**#, Yaojun Wu#, Runsen Feng, Zhizheng Zhang, Zhibo Chen*. "3-D Context Entropy Model for Improved Practical Image Compression". In *Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition Workshops*, 2020. (**CVPR Workshop 2020**).
- **Zongyu Guo**, Zhibo Chen*, Tao Yu, Jiale Chen, Sen Liu. "Progressive Image Inpainting with Full-Resolution Residual Network". In *Proceedings of the 27th ACM International Conference on Multimedia*. (**ACM MM 2019**). **Oral** paper with 15 minutes in-person presentation.

Journals:

- **Zongyu Guo**#, Runsen Feng#, Zhizheng Zhang, Xin Jin, Zhibo Chen*. "Learning Cross-Scale Weighted Prediction for Efficient Neural Video Compression". *IEEE Transactions on Image Processing* (**TIP**). One of the first neural video codecs that can compete with VVC in terms of PSNR in some cases.
- **Zongyu Guo**, Zhizheng Zhang, Runsen Feng, Zhibo Chen*. "Causal Contextual Prediction for Learned Image Compression". *IEEE Transactions on Circuits and Systems for Video Technology* (**TCSVT**). The first neural image codec that can surpass VVC in terms of PSNR, based on our top results in CLIC competition.

## Honors and Awards

**Outstanding PhD program** Autumn, 2022
Only seven students were granted for international visiting in 2023, selected from the whole USTC.

**National Scholarship** Autumn 2021, 2020
The top honor in USTC for postgraduate students (<3%).
Among my peers, I am the only student achieving this honor in two consecutive years.

**Outstanding Undergraduate Student** Spring 2019
For undergraduate students (< 10%) in USTC.

**Excellent Student Scholarship Silver Prize** Autumn 2018
For undergraduate students (< 15%) in USTC.

## More Experience

**Internship in Microsoft Research Asia (MSRA).** Dec. 2021 – Nov. 2022
Intelligent Multimedia Group. Beijing, China

**Internship in JD AI Lab.** Dec. 2018 – Apr. 2019
Multimedia Group. Beijing, China

**Seminar in Far Eastern Federal University (FEFU)** June 2017 – July 2017
Seminar for young student leaders from pacific-rim universities. Vladivostok, Russia

## Service

Serve as a reviewer for journals including TIP, TNNLS, TCSVT, IJCV, Neurocomputing.
Serve as a reviewer for conferences including NeurIPS, ICLR, AAAI, VCIP etc.
Work as a teaching assistant (TA) for the Elements of Video Technology (2021 Postgraduate Student Course).