

Zhifeng Kong

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Education

University of California San Diego, U.S.

2018 - Current

Ph.D. student in Computer Science and Engineering, AI Group

Advisor: Professor Kamalika Chaudhuri

Xi'an Jiaotong University, China

2014 - 2018

B.S. in Mathematics and Applied Mathematics (Honors Science Program)

Georgia Institute of Technology, U.S. (Visiting School of Math)

Jan. 2017 - May. 2017

University of Alberta, Canada (Visiting School of Math)

July 2016

Current Research

I am a 5-th year PhD student working on machine learning with Prof. Kamalika Chaudhuri at UC San Diego. I work on deep generative models, including Diffusion Model, GAN, Normalizing Flow, and VAE. Specifically, I build state-of-the-art generative (diffusion) models for different applications. Besides diffusion models, I conduct research on interpretability, privacy, post-editing, and expressivity of deep generative models. I am also widely interested in conditional and multi-modal generative models.

Publications & Papers

Deep Generative Models (Diffusion Model)

- Zhaoyang Lyu*, **Zhifeng Kong***, Xudong Xu, Liang Pan, Dahua Lin. *A conditional point diffusion-refinement paradigm for 3d point cloud completion*. In ICLR 2022. (* equal contribution)
<https://arxiv.org/abs/2112.03530>
- **Zhifeng Kong**, Wei Ping, Jiaji Huang, Kexin Zhao, Bryan Catanzaro. *DiffWave: A Versatile Diffusion Model for Audio Synthesis*. In ICLR 2021 (**oral presentation**).
<https://arxiv.org/abs/2009.09761>
- **Zhifeng Kong**, Wei Ping. *On Fast Sampling of Diffusion Probabilistic Models*.
<https://arxiv.org/abs/2106.00132>

Deep Generative Models (GAN, VAE, and Flow)

- **Zhifeng Kong**, Kamalika Chaudhuri. *Forgetting Data from Pre-trained GANs*.
<https://arxiv.org/abs/2206.14389>
- **Zhifeng Kong**, Scott Alfeld. *Approximate Data Deletion in Generative Models*.
<https://arxiv.org/abs/2206.14439>
- **Zhifeng Kong**, Kamalika Chaudhuri. *Understanding Instance-based Interpretability of Variational Auto-Encoders*. In NeurIPS 2021. <https://arxiv.org/abs/2105.14203>
- **Zhifeng Kong**, Kamalika Chaudhuri. *Universal Approximation of Residual Flows in Maximum Mean Discrepancy*. In ICML Workshop on Invertible Neural Networks, Normalizing Flows, and Explicit Likelihood Models (2021). <https://arxiv.org/abs/2103.05793>
- **Zhifeng Kong**, Kamalika Chaudhuri. *The Expressive Power of a Class of Normalizing Flow Models*. In AISTATS 2020. <https://arxiv.org/abs/2006.00392>

Other Papers

- **Zhifeng Kong**, Wei Ping, Amrith Dantrey, Bryan Catanzaro. *Speech Denoising in the Waveform Domain with Self-Attention*. In ICASSP 2022. <https://arxiv.org/abs/2202.07790>
- Zhaoyang Lyu, Ching-Yun Ko, **Zhifeng Kong**, Ngai Wong, Dahua Lin, Luca Daniel. *Fastened CROWN: Tightened Neural Network Robustness Certificates*. In AAAI 2020. <https://arxiv.org/abs/1912.00574>
- **Zhifeng Kong**. *Convergence Analysis of Training Two-hidden-layer Partially Over-parameterized ReLU Networks vis Gradient Descent*. In ICNIP 2020. <https://publications.waset.org/10011232/pdf>

Internship

Baidu Research

Summer 2020

Intern in Baidu Research Institute, Baidu USA

- Conducted research on speech synthesis in the waveform domain.
- First author of *DiffWave: A Versatile Diffusion Model for Audio Synthesis*. <https://arxiv.org/abs/2009.09761>

NVIDIA

Summer 2021 and 2022

Intern in the Applied Deep Learning Research, NVIDIA

- Conducted research on speech denoising with self attention.
- First author of *CleanUNet: Speech Denoising in the Waveform Domain with Self-Attention*. <https://arxiv.org/abs/2202.07790>; <https://github.com/NVIDIA/CleanUNet>
- First author of *CleanUNet-2: Improved Speech Denoising with Self-Attention* (to appear).
- Conducted research on speech denoising with diffusion models.
- Conducted research on MIDI-to-music synthesis with diffusion models.

Invited Talks

I gave invited talks at top conferences including *Machine Learning for Audio Synthesis* workshop at ICML 2022 and *Deep Generative Models and Downstream Applications* workshop at NeurIPS 2021, companies including NVIDIA (internal), and AI communities including AI-Time and TechBeat.

Services

I served as reviewers for NeurIPS 2022, ICLR 2022, ICML 2022, ECCV 2022 Workshop UNCV, UAI 2022 Workshop TPM, NeurIPS 2021, ICML 2020 WorkShop WHI.

Honor

- Departmental Fellowship at UCSD Sep. 2018
 - Student Representative at DeeCamp Aug. 2018
 - The First-Class Scholarship of the Mount Everest Plan Nov. 2015, 2016 and 2017
 - The First-Class Scholarship at Xi'an Jiaotong University Oct. 2015, 2016 and 2017
 - The Outstanding Student Winner at Xi'an Jiaotong University Oct. 2015, 2016 and 2017
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