# Kaizhao Liang

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## EDUCATION

**University of Illinois, Urbana Champaign**  Urbana, IL
*Bachelor of Science in Computer Science (Highest Honors)*  *Aug. 2016 – May 2020*

## EXPERIENCE

**Principal Software Engineer (ML)**  March 2022 – Now
*SambaNova Systems*  *Palo Alto, CA*
- Developing and testing software frameworks for large scale neural network training, such as large language models (GPT3, GPT-Neox, Bloom and Llama), text-image pretraining(CLIP, Stable diffusion) as well as other vision models (ViT and ConvNext).
- Designing novel and efficient algorithms on specialized hardwares(Dataflow). (Structured sparsity for fast inference).
- Leading a cross-functional team ranging from compiler to data collection for research(publications) as well as product development

**Senior Software Engineer (ML)**  March 2021 – March 2022
*SambaNova Systems*  *Palo Alto, CA*
- Mega High Resolution Convolutions Algorithms on Dataflow (100K x 100K)
- Sparsity is all you need (Pixelated Butterfly)

**Software Engineer (ML)**  June 2020 – March 2021
*SambaNova Systems*  *Palo Alto, CA*
- Numerical testing and verification of basic modules for deep learning
- Model building and beta testing compiler stack

**Undergraduate Research Assistant**  June 2018 – May 2020
*Secure Learning Lab advised by Prof. Bo Li*  *Urbana Champaign, IL*
- Investigating various aspects of deep neural networks, including adversarial training, adversarial robustness and attack, transfer learning
- Exploring improving intrinsic bias in convolution neural networks.

## PUBLICATIONS

Communication Efficient Distributed Training with Distributed Lion [ICML 2024]
 Bo Liu, Lemeng Wu, Lizhang Chen, Kaizhao Liang*, Jiaxu Zhu, Chen Liang, Raghuraman Krishnamoorthi, Qiang Liu

Lion Secretly Solves Constrained Optimization: As Lyapunov Predicts [ICLR 2024]
 Lizhang Chen, Bo Liu, Kaizhao Liang*, Qiang Liu

Simulating Disease Progression via Progressive Image Editing
 Kaizhao Liang*, Xu Cao, Kuei-Da Liao, Tianren Gao, Zhengyu Chen, Tejas Nama

Uncovering the Connections Between Adversarial Transferability and Knowledge Transferability [ICML 2021]
 Kaizhao Liang*, Jacky. Y. Zhang*, Boxin Wang, Zhuolin Yang, Sanmi Koyejo, Bo Li

Unrestricted Adversarial Examples via Semantic Manipulation [ICLR 2020]
 Anand Bhattad*, Min Jin Chong*, Kaizhao Liang, Bo Li, David A. Forsyth

Adversarial Mutual Information for Text Generation [ICML 2020]
 Boyuan Pan, Yazheng Yang, Kaizhao Liang, Bhavya Kailkhura, Zhongming Jin, Xian-Sheng Hua, Deng Cai, Bo Li

Pixelated Butterfly: Simple and Efficient Sparse training for Neural Network Models [ICLR 2022]
 Beidi Chen, Tri Dao, Kaizhao Liang, Jiaming Yang, Zhao Song, Atri Rudra, Christopher Re

A Unified Knowledge Distillation Framework for Deep Directed Graphical Models [CVPR 2023]
 Yizhuo Chen, Kaizhao Liang, Zhe Zeng, Shuochao Yao, Huajie Shao

## Patents (US)

**Lossless Tiling In Convolution Networks** Published Feb 2022
- TILING CONFIGURATION (US 11195080 B1)
- Section Boundary (US 11227207 B1)
- Read-Modify-Write in Backward Pass(US 11250061 B1)
- Weight Gradient Calculation(US 11232360 B1)

## Work Authorizations (US)

I am currently on O1-A visa (Individuals with Extraordinary Ability or Achievement). To switch job, a transfer request I-129 needs to be filed by any new potential employers.