

# Yiren Jian

## Research Scientist

ByteDance Inc.

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I am a research scientist at ByteDance Inc., specializing in multi-modal foundational models. My research encompasses a broad spectrum of topics within machine learning, with a particular focus on computer vision, natural language processing, and computational science. Specifically, my work involves continual pre-training and instruction fine-tuning of generative visual-language models, as well as applying AI and ML in various scientific domains.

## Professional Experience

### Research Scientist, ByteDance Inc.

Develop open-sourced visual language models for multimodal understanding.

Manager: Hongxia Yang

Bellevue, WA

Feb. 2024 - Now

### Research Scientist Intern, ByteDance Inc.

Develop efficient generative visual-language models based on LLM.

Advisor: Yunzhe Tao

Bellevue, WA

June. 2023 - Sept. 2023

### Research Scientist Intern, Snap Research at Snap Inc.

Develop neural speakers for affective image captioning.

Advisor: Panos Achlioptas

Palo Alto, CA

June. 2022 - Sept. 2022

### Research Scientist Intern, NEC Labs America

Develop physical-augmented ML models for precision immunotherapy.

Advisor: Martin Renqiang Min

Princeton, NJ

June. 2021 - Sept. 2021

## Education

### Dartmouth College

Doctor of Philosophy - Computer Science

Advisor: Soroush Vosoughi

Hanover, NH, USA

Sept. 2018 - Jan. 2024

### The George Washington University

Master of Science - Biophysics

Advisor: Chen Zeng

Washington DC, USA

Sept. 2015 - May. 2017

### Huazhong University of Science and Technology

Bachelor of Science - Physics

Thesis advisor: Yi Xiao

Wuhan, China

Sept. 2011 - May. 2015

## Publications

### InfiMM: Advancing Multimodal Understanding with an Open-Sourced Visual Language Model

[ACL 2024, findings] Findings of the Association for Computational Linguistics

Haogeng Liu, Quanzeng You, Yiqi Wang, Xiaotian Han, Bohan Zhai, Yongfei Liu, Wentao Chen, **Yiren Jian**, Yunzhe Tao, Jianbo Yuan, Ran He, Hongxia Yang

### Expedited Training of Visual Conditioned Language Generation via Redundancy Reduction

[ACL 2024] The 62nd Annual Meeting of the Association for Computational Linguistics

**Yiren Jian**, Tingkai Liu, Yunzhe Tao, Chunhui Zhang, Soroush Vosoughi, Hongxia Yang

### GEM: Generating Engaging Multimodal Content

[IJCAI 2024] International Joint Conference on Artificial Intelligence

Chongyang Gao, **Yiren Jian**, Natalia Denisenko, Soroush Vosoughi, V.S. Subrahmanian

### Efficient and Effective Learning of Foundational Large Multi-Modal Models

Dartmouth College PhD Dissertations, 2024

**Yiren Jian**

## **RNet: a network strategy to predict RNA binding preferences**

Briefings in Bioinformatics, 2024

Haoquan Liu, **Yiren Jian**, Jinxuan Hou, Ceng Zeng, Yunjie Zhao

## **Bootstrapping Vision-Language Learning with Decoupled Language Pre-training**

[NeurIPS 2023, spotlight] Advances in Neural Information Processing Systems

**Yiren Jian**, Chongyang Gao, Soroush Vosoughi

## **Evaluation of DNA-protein complex structures using the deep learning method**

Physical Chemistry and Chemical Physics, 2023

Chengwei Zeng<sup>#</sup>, **Yiren Jian**<sup>#</sup>, Chen Zhuo, Anbang Li, Chen Zeng, Yunjie Zhao

## **Knowledge from Large-Scale Protein Contact Prediction Models Can Be Transferred to the Data-Scarce RNA Contact Prediction Task**

preprint, 2023

**Yiren Jian**<sup>†</sup>, Chongyang Gao, Chen Zeng, Yunjie Zhao, Soroush Vosoughi<sup>†</sup>

## **Evaluating Native-like Structures of RNA-protein Complexes Through the Deep Learning Method**

Nature Communications, 2023

Chengwei Zeng<sup>#</sup>, **Yiren Jian**<sup>#</sup>, Soroush Vosoughi, Chen Zeng, Yunjie Zhao

## **Non-Linguistic Supervision for Contrastive Learning of Sentence Embeddings**

[NeurIPS 2022] Advances in Neural Information Processing Systems

**Yiren Jian**, Chongyang Gao, Soroush Vosoughi

## **T-Cell Receptor-Peptide Interaction Prediction with Physical Model Augmented Pseudo-Labeling**

[KDD 2022, oral presentation] In Proceedings of the 28th ACM SIGKDD Conference on Knowledge Discovery and Data Mining

**Yiren Jian**, Erik Kruus, Martin Renqiang Min

## **Embedding Hallucination for Few-shot Language Fine-tuning**

[NAACL 2022] In Proceedings of the 2022 Conference of the North American Chapter of the Association for Computational Linguistics: Human Language Technologies

**Yiren Jian**, Chongyang Gao, Soroush Vosoughi

## **Contrastive Learning for Prompt-based Few-shot Language Learners**

[NAACL 2022] In Proceedings of the 2022 Conference of the North American Chapter of the Association for Computational Linguistics: Human Language Technologies

**Yiren Jian**, Chongyang Gao, Soroush Vosoughi

## **Label Hallucination for Few-Shot Classification**

[AAAI 2022] Proceedings of the 36th AAAI Conference on Artificial Intelligence

**Yiren Jian**, Lorenzo Torresani

## **MetaPix: Domain Transfer for Semantic Segmentation by Meta Pixel Weighting**

Image and Vision Computing, 2021

**Yiren Jian**, Chongyang Gao

## **Task Meta-Transfer from Limited Parallel Labels**

Meta-Learning Workshop at Neural Information Processing Systems, 2020

**Yiren Jian**, Karim Ahmed, Lorenzo Torresani

## **DIRECT: RNA Contact Predictions by Integrating Structural Patter**

BMC Bioinformatics, 2019

**Yiren Jian**, Xiaonan Wang, Jiadi Qiu, Huiwen Wang, Zhichao Liu, Yunjie Zhao, Chen Zeng

## **Trace, Machine Learning of Signal Images for Trace-Sensitive Mass Spectrometry: A Case Study from Single-Cell Metabolomics**

Analytical Chemistry, 2019

Zhichao Liu, Erika P. Portero, **Yiren Jian**, Yunjie Zhao, Rosemary M. Onjiko, Chen Zeng, Peter Nemes

## **Design of Tat-activated Cdk9 Inhibitor**

Journal of Peptide Research and Therapeutics, 2019

Yunjie Zhao, Hao Chen, Chenghang Du, **Yiren Jian**, Haotian Li, Yi Xiao, Mohammed Saifuddin, Fatah Kashanchi, and Chen Zeng

## **Rbind: Computational Network Method to Predict the Binding Sites of RNA Molecules**

Bioinformatics, 2018

Kaili Wang<sup>#</sup>, **Yiren Jian**<sup>#</sup>, Huiwen Wang, Chen Zeng and Yunjie Zhao

**Computational Study of Non-catalytic T-loop Pocket on CDK Proteins for Drug Development**

Chinese Physics B, 2017

Huiwen Wang, Kaili Wang, Zeyu Guan, **Yiren Jian**, Ya Jia, Fatah Kashanchi, Chen Zeng, Yunjie Zhao

**Network Analysis Reveals the Recognition Mechanism for Dimer Formation of Bulb-type Lectins**

Scientific Report, 2017

Yunjie Zhao<sup>#</sup>, **Yiren Jian**<sup>#</sup>, Zhichao Liu, Hang Liu, Qin Liu, Chanyou Chen, Zhangyong Li, Lu Wang, H. Howie Huang, Chen Zeng

**Patents**

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**T-cell receptor repertoire selection prediction with physical model augmented pseudo-labeling** (w/ NEC Labs America)

**Academic Services**

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- 2024 **Invited Reviewer**, European Conference on Computer Vision
- 2024 **Invited Reviewer**, Conference on Language Modeling
- 2024 **Invited Reviewer**, International Conference on Machine Learning
- 2024 **Invited Reviewer**, International Conference on Learning Representations
- 2024 **Invited Reviewer**, Annual AAAI Conference on Artificial Intelligence
- 2023 **Invited Reviewer**, Northern European Journal of Language Technology
- 2023 **Invited Reviewer**, IEEE/CVF Winter Conference on Applications of Computer Vision
- 2023 **Invited Reviewer**, Conference on Neural Information Processing Systems
- 2023 **External Reviewer**, Annual Meeting of the Association for Computational Linguistics

**Teaching Experience**

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| 2019, 2021 <b>Graduate Teaching Assistant</b> , Deep Learning (graduate-level course)    | Dartmouth |
| 2021-2023 <b>Graduate Teaching Assistant</b> , Machine Learning (graduate-level course)  | Dartmouth |
| 2018 <b>Graduate Teaching Assistant</b> , Machine Learning (graduate-level course)       | Dartmouth |
| 2015-2016 <b>Graduate Teaching Assistant</b> , University Physics (undergraduate course) | GWU       |