Jieneng Chen

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Research Overview

My research asks how intelligence can be grounded in the real world to meaningfully benefit humanity. I develop foundation neural architectures that learn scalable representations from raw visual data, enabling predictive visual models and closed-loop embodied intelligence. I further translate these ideas into proactive biomedical systems to enhance human life.
Research Areas: Computer Vision, Robotics, World Models, AI for Biomedicine, Generative AI.

Education

Johns Hopkins University Aug. 2020 - present
Ph.D. candidate & Teaching Instructor in Computer Science
Advisors: Alan Yuille (Primary), Rama Chellappa, and Daniel Khashabi.

Technical University of Munich (Undergraduate exchange student) 2017 - 2018

Tongji University, Shanghai. (B.S. in Computer Science) 2016 - 2020

Honors & Awards

Siebel Scholar Award, among the best computer science / bioengineering scholars worldwide. 2025

MICCAI Doctoral Thesis Award runner-up (**1 of top 3** worldwide) 2025

NVIDIA Academic Grant Award, on "Photorealistic World Generation" ($100K in compute). 2025

KDD CCC Best Paper Award 2025

MICCAI Best Paper Award runner-up, 3/3677 (**top 0.1%**) 2025

Most Cited AI Papers of the Year (TransUNet, 9000 citations, source) 2022

Top 3 Most Cited ECCV Papers (Swin-Unet, 6000 citations, source) 2025

Top 3 Most Influential AAAI Papers (TransFG, 600 citations, source) 2023

Schmidt Science Fellow, (invited) nominee class 2026 (1 of 7 at JHU) 2025

DAAD AINet Fellow, Germany, class 2022 2022

CVPR 2025 Doctoral Consortium with an NSF Travel Award (best final-year PhDs) 2025

RSNA 2025 Certificate of Merit Award 2025

Visionary Award, LLM Hackathon for Applications in **Materials Science & Chemistry** 2025

Awards to Undergraduate Mentees

Michael J. Muuss Research Award (TaiMing Lu), 1 of 1 at JHU 2025

CRA Outstanding Undergraduate Researcher Award Finalist (TaiMing Lu), 1 of 24 Nationwide 2025

CRA Outstanding Undergraduate Researcher Award Nominee (Arda Uzunoglu) 2026

Teaching

Instructor at JHU: 'Machine Imagination', EN.601.208, all levels of undergraduate, 2025 & 2026.

Publications [updated list in Google Scholar] 19 first-/senior-author papers

(* equal contribution; † equal advising)

1. [**ICLR 2026** under review] Jiahan Zhang*, Muqing Jiang*, Nanru Dai, TaiMing Lu, Arda Uzunoglu, Shunchi Zhang, Yana Wei, Jiahao Wang, Vishal M. Patel, Paul Pu Liang, Daniel Khashabi, Cheng Peng, Rama Chellappa, Tianmin Shu, Alan Yuille, Yilun Du, **Jieneng Chen**†. "World-in-World: World Models in a Closed-Loop World," ***top 1.3%*** *in the open statistics*, 2026. [OpenReview] [PDF]

2. [**WACV 2026**] Shanshan Zhong, Jiawei Peng, Zehan Zheng, Zhongzhan Huang, ..., Alan Yuille, **Jieneng Chen**†. "4D-Animal: Freely Reconstructing Animatable 3D Animals from Videos," *WACV*, 2025.

3. [**ICLR 2025**] Taiming Lu, Tianmin Shu, Alan Yuille, Daniel Khashabi, **Jieneng Chen**†. "GenEx: Generating an Explorable World," *ICLR*, 2025. [PDF] [Project]

4. [**CVPR 2025**] Wufei Ma, Luoxin Ye, Celso de Melo, Alan Yuille, **Jieneng Chen**†. "Spatial-LLM: A Compound 3D-Informed Design toward Spatially-Intelligent Large Multimodal Models," *CVPR*, 2025. **(Highlight, 3%)**

5. [**CVPR 2025**] Xingrui Wang, Celso M. de Melo, **Jieneng Chen**†, Alan Yuille†. "Spatial457: A Diagnostic Benchmark for Comprehensive Spatial Reasoning of Large Mutimodal Models," *CVPR*, 2025. **(Highlight, 3%)**

6. [**NeurIPS 2025**] Tiezheng Zhang, Yitong Li, Yu-cheng Chou, **Jieneng Chen**, Alan Yuille, Chen Wei, Junfei Xiao. "Vision-Language-Vision Auto-Encoder: Scalable Knowledge Distillation from Diffusion Models," *NeurIPS*, 2025.

7. [**ICCV 2025**] Yijun Yang, Zhao-Yang Wang, Qiuping Liu, Shuwen Sun, Kang Wang, Rama Chellappa, Zongwei Zhou, Alan Yuille, Lei Zhu, Yu-Dong Zhang, **Jieneng Chen**†. "Medical World Model: Generative Simulation of Tumor Evolution for Treatment Planning," *ICCV*, 2025. [PDF] [Project]

8. [**preprint 2025**] Jiahao Wang*, Luoxin Ye*, TaiMing Lu, Junfei Xiao, Jiahan Zhang, Yuxiang Guo, Xijun Liu, Rama Chellappa, Cheng Peng, Alan Yuille, **Jieneng Chen**†. "EvoWorld: Evolving Panoramic World Generation with Explicit 3D Memory," *Under review in CVPR*, 2026.

9. [**KDD 2025**] **Jieneng Chen**, Kang Wang, Yang Yang, Yuyin Zhou. "From Medical World Models to Intelligent Digital Twins: A Blue Sky Vision for Proactive Medicine," *KDD Healthday*, 2025. **(KDD CCC Best Paper Award)**

10. [**ICCV 2025**] Wufei Ma, Haoyu Chen, Guofeng Zhang, Yu-Cheng Chou, **Jieneng Chen**, Celso M de Melo, Alan Yuille. "A Comprehensive 3D Spatial Reasoning Benchmark," *ICCV*, 2025.

11. [**MICCAI 2025**] Pedro RAS Bassi, Wenxuan Li, **Jieneng Chen**, Zheren Zhu, Tianyu Lin, Sergio Decherchi, Andrea Cavalli, Kang Wang, Yang Yang, Alan L Yuille, Zongwei Zhou. "Learning Segmentation from Radiology Reports," *MICCAI*, 2025. **(MICCAI Best Paper Award Runner-up)**

12. [**BMVC 2025**] Ruxiao Duan, **Jieneng Chen**, Adam Kortylewski, Alan Yuille, Yaoyao Liu. "Prompt-Based Exemplar Super-Compression and Regeneration for Class-Incremental Learning," *BMVC*, 2025.

13. [**FG 2025**] Zhaoyang Wang, Jiang Liu, Yuxiang Guo, **Jieneng Chen**, Rama Chellappa. "Unigait: A unified transformer-based multitask framework for gait analysis in the wild," *FG*, 2025.

14. [**WACV 2025**] Zhaoyang Wang, Jiang Liu, **Jieneng Chen**†, Rama Chellappa†. "VM-Gait: Multi-Modal 3D Representation Based on Virtual Marker for Gait Recognition," *WACV*, 2025.

15. [**MedIA 2024**] **Jieneng Chen**, Jieru Mei, Xianhang Li, Yongyi Lu, Qihang Yu, Qingyue Wei, Xiangde Luo, Yutong Xie, Ehsan Adeli, Yan Wang, Matthew P Lungren, Shaoting Zhang, Lei Xing, Le Lu, Alan

Yuille, Yuyin Zhou. "TransUNet: Rethinking the U-Net Architecture Design for Medical Image Segmentation through the Lens of Transformers," *Medical Image Analysis*, 2024. **(the Most Downloaded Paper in ScienceDirect)**

16. [**NeurIPS 2024**] **Jieneng Chen***, Luoxin Ye*, Ju He*, Zhaoyang Wang, Daniel Khashabi†, Alan Yuille†. "Efficient Large Multi-modal Models via Visual Context Compression," *NeurIPS*, 2024. [PDF]
17. [**CVPR 2024**] **Jieneng Chen***, Qihang Yu*, Xiaohui Shen, Alan Yuille, Liang-Chieh Chen. "ViTamin: Designing Scalable Vision Models in the Vision-Language Era," *CVPR*, 2024. [PDF]
18. [**ICASSP 2024**] Shuyang Sun*, **Jieneng Chen***, Ruifei He, Alan Yuille, Philip Torr, Song Bai. "LUMix: Improving Mixup by Better Modelling Label Uncertainty," *ICASSP*, 2024. [PDF]
19. [**ICCV 2023**] **Jieneng Chen**, Yingda Xia, Jiawen Yao, Ke Yan, Jianpeng Zhang, Le Lu, Fakai Wang, Bo Zhou, Mingyan Qiu, Qihang Yu, Mingze Yuan, Wei Fang, Yuxing Tang, Minfeng Xu, Jian Zhou, Yuqian Zhao, Qifeng Wang, Xianghua Ye, Xiaoli Yin, Yu Shi, Xin Chen, Jingren Zhou, Alan Yuille, Zaiyi Liu, Ling Zhang. "CancerUniT: Towards a Single Unified Model for Effective Detection, Segmentation, and Diagnosis of Eight Major Cancers Using a Large Collection of CT Scans," *ICCV*, 2023.
20. [**CVPR 2023**] Ju He*, **Jieneng Chen***, Mingxian Lin, Qihang Yu, Alan Yuille. "Compositor: Bottom-Up Clustering and Compositing for Robust Part and Object Segmentation," *CVPR*, 2023. [PDF]
21. [**CVPR 2022**] **Jieneng Chen***, Shuyang Sun*, Ju He, Philip Torr, Alan Yuille, Song Bai. "TransMix: Attend to Mix for Vision Transformers," *CVPR*, 2022. [PDF]
22. [**AAAI 2022**] Ju He, **Jieneng Chen**, Shuai Liu, Adam Kortylewski, Cheng Yang, Yutong Bai, Changhu Wang, Alan Yuille. "TransFG: A Transformer Architecture for Fine-Grained Recognition," *AAAI*, 2022. **(Most influential AAAI papers)**
23. [**ECCV 2022**] Hu Cao, Yueyue Wang, **Jieneng Chen** et al. "Swin-Unet: Unet-like Pure Transformer for Medical Image Segmentation," *ECCV Workshop on MCV*, 2022. [PDF] **(Top 3 Most Cited ECCV Paper; 6,000 citations)**
24. [**ECCV 2022**] Ju He, Shuo Yang, Shaokang Yang, Adam Kortylewski, Xiaoding Yuan, **Jieneng Chen**, Shuai Liu, Cheng Yang, Alan Yuille. "Part-ImageNet: A large, high-quality dataset of parts," *ECCV*, 2022.
25. [**ICML 2021**] **Jieneng Chen**, Yongyi Lu, Qihang Yu, Xiangde Luo, Ehsan Adeli, Yan Wang, Le Lu, Alan L Yuille, Yuyin Zhou. "TransUNet: Transformers make Strong Encoders for Medical Image Segmentation," *ICML Workshop on IMLH*, 2021. [PDF] **(Top 15 Cited AI Papers; 8,500 citations)**
26. [**MICCAI 2021**] **Jieneng Chen**, Ke Yan, Yu-Dong Zhang, Youbao Tang, Xun Xu, Shuwen Sun, Qiuping Liu, Lingyun Huang, Jing Xiao, Alan L Yuille, Ya Zhang, Le Lu. "Sequential Learning on Liver Tumor Boundary Semantics and Prognostic Biomarker Mining," *MICCAI, Travel Award (top 10%)*, 2021. [PDF]
27. [**MICCAI 2020**] Tao Song*, **Jieneng Chen***, Xiangde Luo, Yechong Huang, Xinglong Liu, Ning Huang, Yinan Chen, Zhaoxiang Ye, Huaqiang Sheng, Shaoting Zhang, Guotai Wang. "CPM-Net: A 3D center-points matching network for pulmonary nodule detection in CT scans," *MICCAI, top 10%*, 2021.
28. [**AAAI 2021**] Xiangde Luo, **Jieneng Chen**, Tao Song, Guotai Wang. "Semi-Supervised Medical Image Segmentation through Dual-task Consistency," *AAAI*, 2021.[PDF] **(Most influential AAAI papers)**

PATENT

"Data augmentation based on attention," US Patent App. 17/740,211

"A hybrid model for vision systems," US Patent App. 18/402,048

Mentoring

Taiming Lu 2024-2025
Undergraduate student at Johns Hopkins University, now PhD at Princeton
Accomplishment: 1 ICLR 2025 on world models; CRA Outstanding Undergraduate Researcher Award Finalist (1 of 24 nationwide); Michael J. Muuss Undergraduate Research Award.

Shanshan Zhong 2024-2025
Visiting graduate student at Johns Hopkins University, now PhD at CMU
Accomplishment: 1 WACV 2026 on 4D vision.

Service, Diversity & Inclusion

Lead organizer, CVPR Workshop on "World Models Meets Active Embodied Planning", 2026.

Co-organizer, CVPR Workshop on "Generative Models for Computer Vision", 2026.

Co-organizer, ICCV Workshop on "Embodied Spatial Reasoning", 2025.

Co-organizer, CVPR Workshop on "Generative Models for Computer Vision", 2025.

Co-organizer, MICCAI Satellite Event "Body Maps: Towards 3D Atlas of Human Body", 2024.

Co-organizer, ISBI Challenge of "Towards 3D Atlas of Human Body", 2024.

Conference Reviewer: CVPR, ICCV, ECCV, NeurIPS, ICLR, ICML, AAAI, WACV, MICCAI, CogSci etc.

Journal Reviewer: TMI, TPAMI, IJCV etc.

Diversity & Inclusion:

(i) JHU CS mentor hours.

(ii) Lecture for JHU WSE Pre-College Program 2025.

Invited Talks

External Speaker Series, University of Illinois Urbana-Champaign, Oct 2025.

MINDs Seminar, Johns Hopkins University, Oct 2025.

Guest Lecture, Rice University, Oct 2025.

CLSP Seminar, Johns Hopkins University, Sep 2025.

Lab Seminar, Stanford University, Aug 2025.

Lab Seminar, Harvard Medical School & Public Health & Dana-Farber Cancer Institute, Aug 2025.

NSF IAIFI on Physics & AI, Boston, Aug 2025.

Computational Seminar, Chemical and Biomolecular Engineering, Johns Hopkins Univeristy, May 2025.

Cognitive Science Brown Bag Talk, Johns Hopkins University, Apr 2025.

ICLR Workshop on "Embodied Intelligence with Large Language Models In Open City Environment", Singapore, April 2025.

References are available upon request or via Interfolio

Computer Vision, NLP, Robotics, and Cognitive Science.

- Prof. **Alan Yuille**, **JHU**, **Computer Vision and Cognitive Science**; Relation: Advisor.
- Prof. **Rama Chellappa**, **JHU**, **Computer Vision**; Relation: Mentor.
- Prof. **Daniel Khashabi**, **JHU**, **Natural Language Processing**; Relation: Mentor.
- Prof. **Tianmin Shu**, **JHU**, **Social AI**; Relation: Co-author.
- Prof. **Zhuowen Tu**, **UCSD**, **Computer Vision**; Relation: Independent recommender.

AI for Biomedicine and Science.

- Prof. **Yang Yang**, **UCSF**, **Medical AI**; Relation: Co-author.
- Prof. **Denis Wirtz**, **JHU**, **Biophysics**; Relation: Co-author.
- Dr. **Le Lu**, **Ant Group**, **Medical AI**; Relation: Internship host.
- Prof. **Paulette Clancy**, **JHU**, **AI for Material Science**; Relation: Co-author.
- Prof. **Ruijiang Li**, **Stanford**, **Computational Pathology**; Relation: Independent recommender.