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Zeyu Zhang

Hangzhou, China

Profile

Zeyu Zhang is an undergraduate researcher under the guidance of Prof. Richard Hartley and Prof. Ian Reid. His research interests are rooted in computer vision, focusing on generative 3D modeling and AI for health. Specifically, he is dedicated to advancing efficient and high-quality motion and avatar generation, as well as 3D medical imaging segmentation and representation learning. With extensive experience across multiple research disciplines, Zeyu actively explores cutting-edge advancements in both the foundational and applied aspects of artificial intelligence. He has also collaborated closely with Asst. Prof. Hao Tang (PKU), Prof. Bohan Zhuang (ZJU), Dr. Yang Zhao (La Trobe), Dr. Minh-Son To (FHMRI), and many others. Zeyu is actively seeking opportunities and collaborations in both academia and industry.

Research Experiences

Research Assistant **Aug 2024 - Present**
Zhejiang University (ZJU) *Hangzhou, Zhejiang*

Research Topic: Efficient generative models, advised by

- Prof. Bohan Zhuang, ZJU

Project Contribution:

- Efficient video and 3D motion generation.

Visiting Student Researcher **July 2024 - Present**
Peking University (PKU) *Beijing, China*

Research Topic: 3D human motion generation, advised by

- Asst. Prof. Hao Tang, PKU

Project Contribution:

- Generates extended motion generation with key frame masking.

Research Intern **May 2024 - June 2024**
Mohamed bin Zayed University of Artificial Intelligence (MBZUAI) *Abu Dhabi, UAE*

Research Topic: Unsupervised classification of cellular structures based on cryo-electron tomography, advised by

- Professor Ian Reid FAA FTSE, AIML & MBZUAI
- Assoc. Prof. Min Xu, CMU & MBZUAI

Project Contribution:

- Developed a novel mamba model for efficient and long sequence human motion generation.
- Achieved 4 time faster than the previous state-of-the-art methods.

Research Assistant **Apr 2024 - Present**
La Trobe University *Bundoora, VIC*

Research Topic: 3D generation and AI for Heath, hosted by

- Dr. Yang Zhao, La Trobe University

Project Contribution:

- Generates both human and animal mesh and motion simultaneously customizing a LLM agent.

Research Assistant **Jan 2024 - June 2024**
Monash University *Clayton, VIC*

Research Topic: Efficient and Long Sequence Human Motion Generation, advised by

- Emeritus Distinguished Professor Richard Hartley FRS FAA FIEEE, Australian National University
- Professor Ian Reid FAA FTSE, AIML & MBZUAI
- Dr. Hao Tang, The Robotics Institute, Carnegie Mellon University (CMU)
- Dr. Bohan Zhuang, Monash University

Project Contribution:

- Developed a novel mamba model for efficient and long sequence human motion generation.
- Achieved 4 time faster than the previous state-of-the-art methods.

Visiting Student Researcher **Mar 2023 - Dec 2023**
Australian Institute for Machine Learning (AIML) *University of Adelaide*

Research Topic: 3D Thin-Slice Segmentation of Non-Contrast CT (NCCT) Images using Thick-Slice Annotations: A Novel Approach for Medical Imaging Segmentation, advised by

- Emeritus Distinguished Professor Richard Hartley FRS FAA FIEEE, Australian National University
- Professor Ian Reid FAA FTSE, AIML & MBZUAI
- Dr. Minh-Son To, Flinders Health and Medical Research Institute (FHMRI)

Project Contribution:

- Developed a novel pipeline for 3D thin-slice medical imaging segmentation on Non-Contrast Computed Tomography (NCCT) with only anotations on thick slices.
- Published a benchmark dataset for thin-slice 3D multi-semantic medical imaging segmentation with annotated evaluation set.

Visiting Student Researcher **Nov 2022 - Mar 2023**
Australian Institute for Machine Learning (AIML) *University of Adelaide*

Research Topic: The BHSD Dataset: A 3D Brain Hemorrhage Segmentation Dataset with multi-class and multi-annotated information, advised by

- Dr. Yifan Liu, Australian Institute for Machine Learning (AIML)
- Dr. Yutong Xie, Australian Institute for Machine Learning (AIML)
- Dr. Minh-Son To, Flinders Health and Medical Research Institute (FHMRI)

Project Contribution:

- Published a new benchmark dataset for multi-semantic brain hemorrhage segmentation, which consists 191 pixel-level annotated volumes, and over 2000 negative (healthy) volumes.
- Proposed a novel semi-supervised and weak-supervised segmentation pipeline which improves the performance up to 10%.

Research Intern **Feb 2023 - Jun 2023**
National Computational Infrastructure (NCI) *Canberra*

Research Topic: Analyzing the Research Trend of Covid-19 Literature: Revisiting Long-tail Large-scale Multi-label Text Classification, advised by

- Dr. Jingbo Wang, National Computational Infrastructure (NCI)

Project Contribution:

- Developed a state-of-the-art pipeline for Large-scale Multi-label Text Classification (LMTC) which achieved 97% accuracy compared with vanilla LSTM 79%.

Student Researcher **Jul 2022 - Oct 2022**
The Australian National University *Canberra*

Research Topic: A Deep Learning Approach to Diabetes Diagnosis, advised by

- Professor Tom Gedeon, Curtin University
- Dr. Md Zakir Hossain, CSIRO Data61
- Dr. Khandaker Asif Ahmed, CSIRO
- Md Rakibul Hasan, Curtin University

Project Contribution:

- Proposed a state-of-the-art pipeline for non-invasive diabetes diagnosis, which evaluated on multiple publish benchmarks and datasets, and achieved 85% overall accuracy.

Education

Bachelor of Science (Advanced) (Honours) **2021 - 2025 (expected)**
Australian National University

Main courses: Deep Learning, Computer Vision, Machine Learning

Visiting Student **2022**
Imperial College London

Main courses: Machine Learning, Applied Statistics

Publications

Motion Mamba: Efficient and Long Sequence Motion Generation with Hierarchical and Bidirectional Selective SSM **2024**
Zeyu Zhang*, Akide Liu*, Ian Reid, Richard Hartley, Bohan Zhuang, Hao Tang*✉
ECCV 2024

KMM: Key Frame Mask Mamba for Extended Motion Generation **2024**
Zeyu Zhang*, Hang Gao*, Akide Liu, Qi Chen, Feng Chen, Yiran Wang, Danning Li, Hao Tang*✉
In Submission (available soon)

InfiniMotion: Mamba Boosts Memory in Transformer for Arbitrary Long Motion Generation **2024**
Zeyu Zhang*, Akide Liu, Qi Chen, Feng Chen, Ian Reid, Richard Hartley, Bohan Zhuang, Hao Tang*✉
Preprint

Motion Avatar: Generate Human and Animal Avatars with Arbitrary Motion **2024**
Zeyu Zhang*, *Yiran Wang**, *Biao Wu**, *Shuo Chen, Zhiyuan Zhang, Shiya Huang, Wenbo Zhang, Meng Fang, Ling Chen, Yang Zhao*✉*
BMVC 2024

JointViT: Modeling Oxygen Saturation Levels with Joint Supervision on Long-Tailed OCTA **2024**
Zeyu Zhang*, Xuyin Qi, Mingxi Chen, Guangxi Li, Ryan Pham, Ayub Qassim, Ella Berry, Zhibin Liao, Owen Siggs, Robert Mclaughlin, Jamie Craig, Minh-Son To*
MIUA 2024 Oral

SegReg: Segmenting OARs by Registering MR Images and CT Annotations **2023**
Zeyu Zhang*, Xuyin Qi, Bowen Zhang, Biao Wu, Hien Le, Bora Jeong, Zhibin Liao, Yunxiang Liu, Johan Verjans, Minh-Son To, Richard Hartley*✉
ISBI 2024

MedDet: Generative Adversarial Distillation for Efficient Cervical Disc Herniation Detection **2024**
Zeyu Zhang*, *Nengmin Yi**, *Shengbo Tan**, *Ying Cai*✉*, Yi Yang, Lei Xu, Qingtai Li, Zhang Yi, Daji Ergu, Yang Zhao*
In Submission (available soon)

Thin-Thick Adapter: Segmenting Thin Scans Using Thick Annotations **2023**
Zeyu Zhang*, Bowen Zhang, Abhiram Hiwase, Feng Chen, Akide Liu, Christen Barras, Biao Wu, Adam Wells, Daniel Ellis, Benjamin Reddi, Andrew Burgan, Minh-Son To, Ian Reid*✉*, Richard Hartley*✉
Preprint

A Deep Learning Approach to Diabetes Diagnosis **2022**
Zeyu Zhang*, Khandaker Asif Ahmed, Md Rakibul Hasan, Tom Gedeon, Md Zakir Hossain*
ACIIDS 2024

ESA: Annotation-Efficient Active Learning for Semantic Segmentation **2024**
*Jinchao Ge, **Zeyu Zhang**, Minh Hieu Phan, Bowen Zhang, Akide Liu, Yang Zhao*✉
Preprint

SegStitch: Multidimensional Transformer for Robust and Efficient Medical Imaging Segmentation **2024**
*Shengbo Tan, **Zeyu Zhang**, Ying Cai*✉*, Daji Ergu, Lin Wu, Binbin Hu, Pengzhang Yu, Yang Zhao*
Preprint

Sine Activated Low-Rank Matrices for Parameter Efficient Learning **2024**
*Yiping Ji**, *Hemanth Saratchandran**, *Cameron Gordon, **Zeyu Zhang**, Simon Lucey*✉
Preprint

XLIP: Cross-modal Attention Masked Modelling for Medical Language-Image Pre-Training **2024**
*Biao Wu**, *Yutong Xie**, ***Zeyu Zhang****, Minh Hieu Phan, Qi Chen, Ling Chen, Qi Wu*✉
Preprint

A Landmark-based Approach for Instability Prediction in Distal Radius Fractures **2023**
*Yang Zhao, Zhibin Liao, Yunxiang Liu, Koen Oude Nijhuis, Britt Barvelink, Jasper Prijs, Joost Colaris, Mathieu Wijffels, Max Reijman, **Zeyu Zhang**, Minh-Son To, Ruurd Jaarsma, Job Doornberg, Johan Verjans*
ISBI 2024

Can Rotational Thromboelastometry Rapidly Identify Theragnostic Targets in Isolated Traumatic Brain Injury? **2023**
Abhiram Hiwase, Christopher Ovenden, Lola Kaukas, Mark Finnis, ***Zeyu Zhang****, Stephanie O'Connor, Ngee Foo, Benjamin Reddi, Adam Wells, Daniel Ellis*
EMA 2024

BHSD: A 3D Multi-Class Brain Hemorrhage Segmentation Dataset **2023**
Biao Wu, Yutong Xie, ***Zeyu Zhang****, Jinchao Ge, Kaspar Yaxley, Suzan Bahadir, Qi Wu, Yifan Liu, Minh-Son To*✉
MLMI 2023

Referees

Prof. Richard Hartley FRS FAA FIEEE **Australian National University**
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Dr. Yang Zhao **La Trobe University**
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