

YUBO ZHANG

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EDUCATION

University of North Carolina at Chapel Hill

Aug. 2018 - (expected) May 2023

Ph.D. candidate in Computer Science

Chapel Hill, NC, USA

Advisor: Prof. Stephen M. Pizer and Jan-Michael Frahm

Research Interest: Machine learning, multimodal modeling, computer vision, natural language processing

In applications of vision and language grounding, 3D reconstruction, medical image analysis

Tsinghua University

Aug. 2014 - Jul. 2018

Bachelor of Engineering in Automation

Beijing, China

Cumulative GPA: 87/100, Major GPA: 89/100

INDUSTRY EXPERIENCE

Meta Platforms, Inc.

May 2022 - Aug. 2022

Machine Learning Engineer Intern - Reality Labs

New York, NY, USA

- Neural network development for AR/VR wristband products - designed multimodal frameworks to fuse multiple streams of sensor signal sequences, applied NLP algorithms to biomedical data.

Amazon.com

May 2021 - Aug. 2021

Applied Scientist Intern, Alexa AI-Natural Understanding

Sunnyvale, CA, USA

- Vision-and-language grounding neural network development - designed multimodal systems with better interpretability, which achieved state-of-the-art on several public datasets of video QA and video retrieval.

RESEARCH EXPERIENCE

University of North Carolina at Chapel Hill

May 2020 - Present

Research Assistant, Department of Computer Science

Chapel Hill, NC, USA

Area: Computer vision

Advisor: Dr. Stephen Pizer and Jan-Michael Frahm

- Worked on monocular depth estimation and real-time 3D reconstruction problems, using deep learning and simultaneous localization and mapping (SLAM) methods and targeting endoscopy applications.
- Developed deep learning methods for image enhancement, improving the lighting of colonoscopy videos.
- Designed geometric algorithms for evaluating the reconstructed 3D colonoscopic surfaces.

University of North Carolina at Chapel Hill

Aug. 2018 - May 2020

Research Assistant, Department of Computer Science

Chapel Hill, NC, USA

Area: Multimodal machine learning and NLP

Advisor: Dr. Mohit Bansal

- Focused on computer vision and natural language grounding problems; developed neural network models for multimodal tasks such as vision-and-language navigation (VLN) and visual question answering (VQA).
- Improved the generalizability and interpretability of multi-modality neural models, with techniques such as object detection, semantic segmentation, knowledge graph and commonsense reasoning.
- Developed machine learning and natural language processing methods for medical concept normalization and relation extraction in social media posts. (Co-advisor: Dr. Alexander Tropsha)

University of Southern California

Jun. 2017 - Sept. 2017

Research Intern, Department of Electrical Engineering

Los Angeles, CA, USA

Area: Computer vision

Advisor: Dr. C.-C. Jay Kuo

- Worked on medical MRI image super-resolution and segmentation problems, using the signal processing method and deep neural networks such as the generative adversarial network.

Tsinghua University

Sept. 2015 - Nov. 2016

Student Researcher in Team Tsinghua-A

Beijing, China

Area: Bioinformation processing

Advisor: Dr. Xiaowo Wang and Dr. Zhen Xie

- Modeled synthetic biological processes using information theory; participated in iGEM 2016 Competition, project wiki: <http://2016.igem.org/Team:Tsinghua-A>.

PUBLICATIONS

Yubo Zhang*, Shuxian Wang*, Sarah K. McGill, Julian G. Rosenman, Jan-Michael Frahm, Soumyadip Sen-gupta, Stephen M. Pizer. “A Surface-normal Based Neural Framework for Colonoscopy Reconstruction,” in *IPMI*, Springer, Cham, 2023.

Yubo Zhang, Feiyang Niu, Qing Ping, Govind Thattai. “A Multi-level Alignment Training Scheme for Video-and-Language Grounding,” in *ICDM 2022, FOMO-VL Workshop*, **selected as spotlight**.

Yubo Zhang, Shuxian Wang, Ruibin Ma, Sarah K. McGill, Julian G. Rosenman, Stephen M. Pizer. “Lighting Enhancement Aids Reconstruction of Colonoscopic Surfaces,” in *IPMI*, Springer, Cham, 2021.

Ruibin Ma*, Rui Wang*, **Yubo Zhang**, Stephen Pizer, Sarah K. McGill, Julian Rosenman, Jan-Michael Frahm. “RNNSLAM: Reconstructing the 3D colon to visualize missing regions during a colonoscopy,” in *Medical image analysis* 72 (2021): 102100.

Peirong Liu, Lin Tian, **Yubo Zhang**, Stephen R. Aylward, Yueh Z. Lee, Marc Niethammer. “Discovering Hidden Physics Behind Transport Dynamics,” in *CVPR* 2021.

Ruibin Ma, Sarah K. McGill, Rui Wang, Julian Rosenman, Jan-Michael Frahm, **Yubo Zhang**, Stephen Pizer. “Colon10K: A Benchmark for Place Recognition in Colonoscopy,” in *ISBI* 2021.

Yubo Zhang*, Hao Tan*, and Mohit Bansal. “Diagnosing the Environment Bias in Vision-and-Language Navigation,” in *IJCAI* 2020: 890-897.

Jiawei Zhou, Yutong Liu, **Yubo Zhang**, Quefeng Li and Yanguang Cao. “Modeling tumor evolutionary dynamics to predict clinical outcomes for patients with metastatic colorectal cancer: a retrospective analysis,” in *Cancer Research* 80.3 (2020): 591-601.

Yibin Xie, Ruiyuan Lin, Yuhua Chen, **Yubo Zhang**, Feng Shi *et al.*. “Super Resolution MRI Using 3D Generative Adversarial Network: Towards Single Breath-Hold Coronary MR Angiography,” in *Joint Annual Meeting ISMRM-ESMRMB*, 2018, Abstract.

Junmin Zhang, **Yubo Zhang**, and Yonggang Guan. “Analysis of time-domain reflectometry combined with wavelet transform for fault detection in aircraft shielded cables,” in *IEEE Sensors Journal*, 16.11 (2016): 4579-4586.

PREPRINTS

Yubo Zhang, Jan-Michael Frahm, Samuel Ehrenstein, Sarah K. McGill, Julian G. Rosenman, Shuxian Wang, Stephen M. Pizer. “ColDE: A Depth Estimation Framework for Colonoscopy Reconstruction,” *arXiv preprint arXiv:2111.10371* (2021).

PROFESSIONAL SERVICES

Reviewer of

Conferences: MICCAI 2022, IPMI 2023, IJCAI 2023

Journal: IEEE Transactions on Medical Imaging

SKILLS

Programming: Python, C/C++, C#, Matlab, Verilog HDL

Tools: PyTorch, L^AT_EX, Git, Linux

Language: Chinese (Native), English

OUTREACH

Women’s Soccer Team of Department of Automation, Tsinghua University
Captain from August 2016 to July 2017

Aug. 2014 - Jul. 2018
Beijing, China

Women’s Soccer Team of Tsinghua University
Team member

Aug. 2015 - Jul. 2018
Beijing, China