

# YUBO ZHANG

(+1) 919-491-7818 [◇ zhangyb@cs.unc.edu](mailto:zhangyb@cs.unc.edu)

Homepage: <https://zhangybzbo.github.io/>

## 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

Research Interest: Machine learning, computer vision, multimodal modeling

In applications of 3D reconstruction, vision and language grounding, 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.

### 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 M. Pizer*

- 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

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

**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:** IEEE Transactions on Medical Imaging (Journal), MICCAI 2022 (Conference)

## SKILLS

---

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

**Tools:** PyTorch, L<sup>A</sup>T<sub>E</sub>X, Git, Linux

**Language:** Chinese (Native), English

## OUTREACH

---

|  |  |
|--|--|
| Women’s Soccer Team of Department of Automation, Tsinghua University<br><i>Captain from August 2016 to July 2017</i> | Aug. 2014 - Jul. 2018<br><i>Beijing, China</i> |
|--|--|

|  |  |
|--|--|
| Women’s Soccer Team of Tsinghua University<br><i>Team member</i> | Aug. 2015 - Jul. 2018<br><i>Beijing, China</i> |
|--|--|