# YUBO ZHANG

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## EDUCATION

**University of North Carolina at Chapel Hill** Aug. 2018 - Present
Ph.D. candidate in Computer Science *Chapel Hill, NC, USA*
Advisors: Prof. Stephen M. Pizer
Research Interest: Computer vision, multimodal modeling and machine learning
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*
*Manager: Dr. Adrien Piérard and Dr. Yingru Liu*
- Developing multimodal neural networks to fuse multiple streams of sensor signals, improving the performance of AR/VR wristband products.

**Amazon.com** May 2021 - Aug. 2021
*Applied Scientist Intern, Alexa AI-Natural Understanding* *Sunnyvale, CA, USA*
*Manager: Dr. Feiyang Niu*
- Developing the video and language grounding framework with better interpretability, applying it to video QA and video retrieval tasks, and achieving state-of-the-art on several public datasets.

## RESEARCH EXPERIENCE

**University of North Carolina at Chapel Hill** May 2020 - Present
*Research Assistant, Department of Computer Science* *Chapel Hill, NC, USA*
*Advisor: Prof. Stephen M. Pizer*
- Working on monocular depth estimation and real-time 3D reconstruction problems. Solving them with deep learning and simultaneous localization and mapping (SLAM) methods. Targeting endoscopy applications.
- Deep learning methods for image enhancement, improving the lighting condition of colonoscopy videos.
- Developing 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*
*Advisor: Prof. Mohit Bansal*
- Focusing on vision and language grounding problems, i.e., vision-and-language navigation (VLN) and visual question answering (VQA) tasks.
- Improving the generalizability and interpretability of multi-modality neural models, with the techniques such as object detection, semantic segmentation, knowledge graph and commonsense reasoning.

*Advisor: Prof. Alexander Tropsha and Prof. Mohit Bansal*
- Medical concept normalization and relation extraction in social media posts with machine learning and natural language processing techniques.

**University of Southern California** Jun. 2017 - Sept. 2017
*Research Intern, Department of Electrical Engineering* *Los Angeles, CA, USA*
*Advisor: Prof. C.-C. Jay Kuo*
- Medical MRI image super-resolution with signal processing and generative adversarial networks.
- Medical MRI image segmentation with deep neural networks.

**Tsinghua University** Sept. 2015 - Nov. 2016
*Student Member in Team Tsinghua-A* *Beijing, China*
*Advisor: Prof. Xiaowo Wang and Prof. Zhen Xie*
- Modeling 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, 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**, Feiyang Niu, Qing Ping, Govind Thattai. "A Multi-level Alignment Training Scheme for Video-and-Language Grounding," *arXiv preprint arXiv:2204.10938* (2022).

**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, LaTeX, Git, Linux
**Language:** Chinese (Native), English

## OUTREACH

Women's Soccer Team of Department of Automation, Tsinghua University — Aug. 2014 - Jul. 2018
*Captain from August 2016 to July 2017* — *Beijing, China*

Women's Soccer Team of Tsinghua University — Aug. 2015 - Jul. 2018
*Team member* — *Beijing, China*