

YUBO ZHANG

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

EDUCATION

University of North Carolina at Chapel Hill

Ph.D. candidate in Computer Science

Advisors: Prof. Stephen M. Pizer

Research Interest: Computer vision and machine learning

3D reconstruction, vision and language grounding, medical image analysis

Aug. 2018 - Present

Chapel Hill, NC, USA

Tsinghua University

Bachelor of Engineering in Automation

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

Aug. 2014 - Jul. 2018

Beijing, China

INDUSTRY EXPERIENCE

Amazon.com

Applied Scientist Intern, Alexa AI-Natural Understanding

Mentor: Dr. Feiyang Niu

May 2021 - Aug. 2021

Sunnyvale, CA, USA

- 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

Research Assistant, Department of Computer Science

Advisor: Prof. Stephen M. Pizer

May 2020 - Present

Chapel Hill, NC, USA

- 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

Research Assistant, Department of Computer Science

Advisor: Prof. Mohit Bansal

Aug. 2018 - May 2020

Chapel Hill, NC, USA

- 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

Research Intern, Department of Electrical Engineering

Advisor: Prof. C.-C. Jay Kuo

Jun. 2017 - Sept. 2017

Los Angeles, CA, USA

- Medical MRI image super-resolution with signal processing and generative adversarial networks.
- Medical MRI image segmentation with deep neural networks.

Tsinghua University

Student Member in Team Tsinghua-A

Advisor: Prof. Xiaowo Wang and Prof. Zhen Xie

Sept. 2015 - Nov. 2016

Beijing, China

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

Tsinghua University & Beihang University

Research Assistant, Department of Electrical Engineering

Advisor: Prof. Yonggang Guan and Prof. Junmin Zhang

Jun. 2015 - Apr. 2016

Beijing, China

- Wavelet transform in cables' fault detection.

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, L^AT_EX, Git, Linux

Language: Chinese (Native), English

OUTREACH

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

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