

# Yufan He

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google scholar: <https://scholar.google.com/citations?user=btkEZXIAAA&hl=en>

## INDUSTRY EXPERIENCES

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- Applied Research Scientist, NVidia, Santa Clara, USA** Nov.2021-Present
- Developing artificial intelligence algorithms for healthcare.
  - AutoML for medical image segmentation.
  - Developing healthcare AI platform MONAI (<https://monai.io/>).
- Intern, NVidia, Santa Clara, USA** Jun.2020-Aug.2020
- Developed an efficient neural architecture search method for 3D medical image segmentation.
  - Ranked first place in the Medical Segmentation Decathlon challenge live leaderboard.
- Intern, SenseTime Research, Beijing, China** Jun.2018-Aug.2018
- Developed a deep learning method for parking spot detection for autonomous driving.
  - Developed a method for generating bird-view images from monocular RGB camera for autonomous driving.
- Consultant, Sonavex Inc., Baltimore, USA** May.2017-Jun.2017
- Developed a segmentation method for polymeric implant in surgical patients from ultrasound images.

## EDUCATION

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**Department of Electrical and Computer Engineering, The Johns Hopkins University, USA** Sep.2016-Oct.2021

*Doctor of Philosophy*, Electrical and Computer Engineering

*Master of Science*, Electrical and Computer Engineering

Overall GPA: 4.0/4.0

Core courses: Medical Image Analysis (A) Medical Imaging Systems (A)  
Deep Learning (A) Deep Learning in Discrete Optimization (A)  
Vision as Bayesian Inference (A) Bayesian Statistics (A)  
Random Signal Analysis (A) Statistical Pattern Recognition (A)  
Approximation Algorithms (audit) Compressed Sensing and Sparse Recovery (A)

**Department of Electronic Engineering, Tsinghua University, China** Aug.2012-Jul.2016

*Bachelor* of Electronic Information Science and Technology

**School of Economics and Management, Tsinghua University, China** Aug.2013-Jul.2016

*Bachelor* of Management (Second Degree)

## RESEARCH EXPERIENCES

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**Image Analysis and Communication Lab, The Johns Hopkins University, USA** Sep.2016- Oct.2021

Faculty Supervisor: Jerry. L. Prince

- Developed a set of deep learning algorithms for automated retinal optical coherence tomography images (OCT) and OCT Angiography images analysis.
- Developed a set of domain adaptation methods for deep networks.
- Developed a set of deep learning algorithms for brain MRI/CT image analysis.

**Penn Image Computing and Science Lab, University of Pennsylvania, USA** Jul.2015-Sep.2015

Faculty Supervisor: James. C. Gee

- Segmentation algorithm and user interface development for canine retinal OCT images.

**Institute of Computer Software, Tsinghua University, China** Apr.2015-Apr.2016

Faculty Supervisor: Yankui Sun

- Retinal OCT image segmentation using boundary surface enhancement and classification with sparse coding and SVM.

**Institute of High-Speed Signal Processing and Network Transmission, Tsinghua University, China** Oct.2014-Jun.2016

Faculty Supervisor: Yimin Liu

- Image motion correction and imaging device design for stepped-frequency microwave induced thermoacoustic tomography.

## TEACHING EXPERIENCES

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**Teaching Assistant, Random Signal Analysis, The Johns Hopkins University, USA** Sep.2017-Dec.2017

Faculty Supervisor: Archana Venkataraman

**Teaching Assistant, Compressed Sensing and Sparse Recovery, The Johns Hopkins University, USA** Feb.2018-May.2018

Faculty Supervisor: Trac D. Tran

## AWARDS

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- MICCAI 2020 Student Travel Award
- MICCAI 2019 Young Scientist Award
- MICCAI 2019 Student Travel Award
- The 2018 George M.L. Sommerman Engineering Graduate Teaching Assistant Award
- 4<sup>th</sup> MICCAI Workshop on Ophthalmic Medical Image Analysis 2017, Best Oral Paper Award

## PUBLICATION

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1. **Yufan He**, et al. “Autoencoder Based Self-Supervised Test-Time Adaptation for Medical Image Analysis”, *Medical Image Analysis*, 2021.
2. **Yufan He**, et al. “DiNTS: Differentiable Neural Network Topology Search for 3D Medical Image Segmentation”, *CVPR 2021*. (Oral)
3. **Yufan He**, et al. “Structured layer surface segmentation for retina OCT using fully convolutional regression networks”, *Medical Image Analysis*, 2020.
4. **Yufan He**, et al. “Self domain adapted network”, *MICCAI 2020*. (Oral)
5. **Yufan He**, et al. “Fully convolutional boundary regression for retina OCT segmentation”, *MICCAI 2019* (Oral). *MICCAI Young Scientist Award*
6. **Yufan He**, et al. “Deep learning based topology guaranteed surface and MME segmentation of multiple sclerosis subjects from retinal OCT”, *Biomedical Optics Express*, 2019.
7. **Yufan He**, et al. “Segmenting retinal OCT images with inter-B-scan and longitudinal information”, *SPIE Medical Imaging 2020*.
8. **Yufan He**, et al. “Adversarial domain adaptation for multi-device retinal OCT segmentation”, *SPIE Medical Imaging 2020* (Oral).
9. **Yufan He**, et al. “Topology guaranteed segmentation of the human retina from OCT using convolutional neural networks.” *arXiv preprint arXiv:1803.05120* (2018).
10. **Yufan He**, et al. “Towards topological correct segmentation of macular OCT from cascaded FCNs.” *4<sup>th</sup> MICCAI workshop on Ophthalmic Medical Image Analysis 2017* (Oral). *OMIA Best Oral Paper Award*
11. **Yufan He**, et al. “Retinal layer parcellation of optical coherence tomography images: Data resource for multiple sclerosis and healthy controls” *Data in Brief*, 2019.
12. **Yufan He**, et al. “Automatic Segmentation of Canine Retinal OCT Using Adaptive Gradient Enhancement and Region Growing”, *SPIE Medical Imaging 2016*.
13. Junyu Chen, **Yufan He**, et al. “ViT-V-Net: Vision Transformer for Unsupervised Volumetric Medical Image Registration”, *MIDL 2021*. (short paper)
14. Shuo Han, **Yufan He**, et al. “Cerebellum parcellation with convolutional neural networks.”, *SPIE Medical Imaging 2019*.
15. Jacob Reinhold, **Yufan He**, et al. “Finding novelty with uncertainty”, *SPIE Medical Imaging 2020*.
16. Jacob Reinhold, **Yufan He**, et al. “Validating uncertainty in medical image translation”, *ISBI 2020*.
17. Shuo Han, Aaron Carass, **Yufan He**, et al. “Automatic cerebellum anatomical parcellation using U-Net with locally constrained optimization”, *NeuroImage*, 2020
18. Junyu Chen, Yong Du, **Yufan He**, et al “TransMorph: Transformer for unsupervised medical image registration”, *Medical Image Analysis 2022* (under review)
19. Yihao Liu, Aaron Carass, **Yufan He**, et al. “Layer boundary evolution method for macular OCT layer segmentation”, *Biomedical Optics Express*, 2019.
20. Dawei Li, Jimin Wu, **Yufan He**, et al. “Parallel deep neural networks for endoscopic OCT image segmentation”, *Biomedical Optics Express*, 2019.
21. Sureerat Reaungamornrat, Aaron Carass, **Yufan He**, et al. “Inter-scanner variation independent descriptors for constrained diffeomorphic demons registration of retina OCT”, *SPIE Medical Imaging 2018*
22. Can Zhao, Aaron Carass, Junghoon Lee, **Yufan He**, et al. “Whole brain segmentation and labeling from CT using synthetic MR images”, *8<sup>th</sup> MICCAI Workshop on Machine Learning in Medical Imaging 2017*.
23. Blake Dewey, Lianrui Zuo, Aaron Carass, **Yufan He**, et al. “A Disentangled Latent Space for Cross-Site MRI Harmonization”, *MICCAI 2020*.
24. Yihao Liu, Lianrui Zuo, Aaron Carass, **Yufan He**, et al. “Variational Intensity Cross Channel Encoder for Unsupervised Vessel Segmentation on OCT Angiography”, *SPIE Medical Imaging 2020*. *SPIE 2020 Best Paper Award (Finalist)*
25. Yankui Sun, Tian Zhang, Yue Zhao, **Yufan He**, “3D automatic segmentation method for retinal optical coherence tomography volume data using boundary surface enhancement”, *Journal of Innovative Optical Health Sciences*, 2016

26. Yihao Liu, Aaron Carass, Angeliki Filippatou, **Yufan He**, et al. "Projection Artifact Suppression for Inner Retina in OCT Angiography", *ISBI 2018*.
27. Lianrui Zuo, Blake Dewey, Aaron Carass, **Yufan He**, et al. "Synthesizing realistic brain MR images with noise control", *SASHIMI 2020*.
28. Lianrui Zuo, Blake Dewey, Yihao Liu, **Yufan He**, et al. "Unsupervised MR harmonization by learning disentangled representations using information bottleneck theory", *NeuroImage 2021*.
29. Lianrui Zuo, Blake Dewey, Aaron Carass, Yihao Liu, **Yufan He**, et al. "Information-based disentangled representation learning for unsupervised MR harmonization", *IPMI 2021*.  
*IPMI 2021 Best Poster Award*
30. Cheng Peng, Andriy M., Ali H., Vish N., Mahfuzur R. S., **Yufan He**, et al. "HyperSegNAS: Bridging One-Shot Neural Architecture Search with 3D Medical Image Segmentation using HyperNet", *CVPR 2022*.

#### Clinical Papers

31. Gonzalez, C. N., Antony, B., **He, Yufan**, et al. "Analysis of agreement of retinal-layer thickness measures derived from the segmentation of horizontal and vertical spectralis OCT macular scans." *Current eye research, 2018*
32. Filippatou, A. G., Vasileiou, E. S., **He, Yufan**, et al. "Evidence of subclinical quantitative retinal layer abnormalities in AQP4-IgG seropositive NMOSD." *Multiple Sclerosis Journal, 2020*
33. Filippatou, A. G., Vasileiou, E. S., **He, Yufan**, et al. "Optic Neuritis–Independent Retinal Atrophy in Neuromyelitis Optica Spectrum Disorder." *Journal of Neuro-Ophthalmology, 2021*.
34. Zusman, R., Carass, A., **He, Yufan**, et al. "Longitudinal Reductions in Thickness of Foveal Inner Retinal Layers in Relation to Progressive Vision Loss in Retinitis Pigmentosa Patients." *Investigative Ophthalmology & Visual Science, 2018*

#### REVIEWER EXPERIENCE

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- IEEE Access
- International Conference on Medical Image Computing and Computer Assisted Intervention (MICCAI)
- IEEE Transactions on Medical Imaging (TMI)
- Medical Image Analysis
- Nature: Scientific Reports
- The Association for the Advancement of Artificial Intelligence (AAAI)