Chenyu (Charles) You

Contact

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Education

Yale University

Ph.D., Electrical Engineering (EE), 2024 *(Expected)*

Advisor: Professor James S. Duncan

Stanford University

M.S., Electrical Engineering (EE), 2019

Advisors: Professor Daniel Rubin

Rensselaer Polytechnic Institute (RPI)

B.S., Electrical Engineering (EE) with a minor in Mathematics, 2017

Advisor: Professor Ge Wang

Professional Experience

Research Assistant Jan 2020 to Present
Image Processing and Analysis Group (IPAG), Yale University New Haven, CT

Student Researcher Oct 2022 to Jan 2023
Google Research Mountain View, CA

Research Intern May 2022 to Aug 2022
Meta Fundamental AI Research (FAIR) New York, NY

Research Intern May 2020 to Aug 2020
Tencent AI Lab Palo Alto, CA

Research Assistant Aug 2019 to Dec 2019
Interactive Machines Group (IMG), Yale University New Haven, CT

Research Assistant Mar 2019 to June 2019
Stanford Network Analysis Platform (SNAP), Stanford University Stanford, CA

Research Assistant Sept 2018 to June 2019
Laboratory of Quantitative Imaging and Artificial Intelligence (QIAI),
Stanford University Stanford, CA

Research Assistant Sept 2016 - Jan 2018 & June 2018 to Sept 2018
Biomedical Imaging Center (BIC), Rensselaer Polytechnic Institute Troy, NY

Research Interests

Machine Learning (ML) for Biomedical Image Analysis

- Learning with Imperfect Medical Data (e.g., label-efficient/self-supervised learning)
- Deep Learning Theory for Medical Image Analysis
- ML for Biomedical Image Analysis (e.g., Foundation Model, Robustness)

Multi-Modal Biomedical Data Analytics

- Multimodal Learning (e.g., biomedical vision-and-language)

Natural Language Processing (NLP) in Healthcare

- Medical NLP (e.g., clinical note, radiology report, patient instruction)

Selected Honors and Impact

Research Service Awards and Scholarships

- Yale George P. O'Leary Graduate Fellowship (Three times awarded) 2019 - 2022
- IEEE TMI Platinum Distinguished Reviewer (Highest award) 2022 - 2023
- IEEE Transactions on Medical Imaging (TMI) Distinguished Reviewer 2021
- Outstanding Reviewer, CVPR 2021
- Medical Physics Journal Distinguished Reviewer 2021 - 2022
- Outstanding Reviewer, MICCAI 2020

Selected Media Coverage

- *Computer Vision News*, "Rethinking Semi-Supervised Medical Image Segmentation: A Variance-Reduction Perspective" (Dec 2023). My paper was covered by this article, ARCO (NeurIPS'23) [Link]

Core Publications

Overview: Mr. Chenyu You has co-authored over **70** papers in top machine learning and biomedical image analysis venues (NeurIPS, ICLR, MICCAI, IPMI, ACL, EMNLP, NAACL, AAAI, IJCAI, npj Digital Medicine, TMI, etc.). By November 2023, his works have been cited over **2,000 times**, with **h-index=26** [Google Scholar].

Mr. You's research involves **trustworthy biomedical image analysis** ranging from **algorithms** to **theoretical guarantees**. His *core publications* are listed below, and organized by four key research themes. A full publication list can be found [here]. Below are his core publications:
‡ denotes the author is his mentee; $*$ indicates an equal contribution.

Theme 1: Label-Efficient Learning with Imperfect Medical Data

- **C. You**, Y. Zhou, R. Zhao, L. Staib, and JS. Duncan, "SimCVD: Simple Contrastive Voxel-Wise Representation Distillation for Semi-Supervised Medical Image Seg-mentation", *IEEE Transactions on Medical Imaging* (**TMI**), 2022.
- **C. You**, W. Dai, Y. Min, L. Staib, and JS. Duncan, "Bootstrapping Semi-supervised Medical Image Segmentation with Anatomical-aware Contrastive Distillation", *Information Processing in Medical Imaging* (**IPMI**), 2023.

Theme 2: Deep Learning Theory for Medical Image Analysis

- **C. You**, W. Dai, Y. Min, F. Liu, DS. Clifton, SK. Zhou, L. Staib, and JS. Duncan, "Rethinking Semi-Supervised Medical Image Segmentation: A Variance-Reduction Perspective", *Advances in Neural Information Processing Systems* (**NeurIPS**), 2023.
- **C. You**, R. Zhao, F. Liu, S. Chinchali, U. Topcu, L. Staib, and JS. Duncan, "Class-Aware Adversarial Transformers for Medical Image Segmentation", *Advances in Neural Information Processing Systems* (**NeurIPS**), 2022.

Theme 3: Foundation Model for Biomedical Image Analysis

- **C. You**, W. Dai, Y. Min, L. Staib, and JS. Duncan, "Implicit Anatomical Rendering for Medical Image Segmentation with Stochastic Experts", *International Conference on Medical Image Computing and Computer Assisted Intervention* (**MICCAI**), 2023. **[Early Accept]**
- J. Ma‡, Y. He‡, F. Li, L. Han, **C. You**, and B. Wang, "Segment Anything in Medical Images", *Nature Communication* (**Nat. Commun.**), 2023.
- **C. You**, Y. Min, W. Dai, JS. Sekhon, L. Staib, and JS. Duncan, "Calibrating Multi-modal Representations: A Pursuit of Group Robustness without Annotations", *IEEE Conference on Computer Vision and Pattern Recognition Conference* (**CVPR**), 2024.

Theme 4: Multi-Modal Biomedical Data Analytics

- **C. You**, W. Dai, Y. Min, L. Staib, and JS. Duncan, "Simple Feature Reweighting for Multi-modal Model Group Robustness", Under Review, *European Conference on Computer Vision* (**ECCV**), 2024.
- F. Liu‡, **C. You**, X. Wu, S. Ge, S. Wang, and X. Sun, "Auto-Encoding Knowledge Graph for Unsupervised Medical Report Generation", *Advances in Neural Information Processing Systems* (**NeurIPS**), 2021.

Other Selected Publications

His *selected publications* are listed below, and organized by five key research themes. A full publication list can be found [here]. Below are his selected publications:
‡ denotes the author is his mentee; $*$ indicates an equal contribution.

Label-Efficient and Self-Supervised Learning with Imperfect Medical Data

- **C. You**, W. Dai, Y. Min, L. Staib, JS. Sekhon, and JS. Duncan, "ACTION++: Improving Semi-supervised Medical Image Segmentation with Adaptive Anatomical Contrast", *International Conference on Medical Image Computing and Computer Assisted Intervention* (**MICCAI**), 2023. **[Early Accept]**
- **C. You**, R. Zhao, L. Staib, and JS. Duncan, "Momentum Contrastive Voxel-wise Representation Learning for Semi-supervised Volumetric Medical Image Segmentation", *International Conference on Medical Image Computing and Computer Assisted Intervention* (**MICCAI**), 2022. **[Early Accept]**
- **C. You**, W. Dai, F. Liu, X. Li, DS. Clifton, L. Staib, and JS. Duncan, "Mine yOur owN Anatomy: Revisiting Medical Image Segmentation with Extremely Limited Labels", Major Revision, *IEEE Transactions on Pattern Analysis and Machine Intelligence* (**TPAMI**), 2023.
- X. Yan‡, J. Naushad, **C. You**, H. Tang, S. Sun, K. Han, H. Ma, JS. Duncan, and X. Xie, "Localized Region Contrast for Enhancing Self-Supervised Learning in Medical Image Segmentation", *International Conference on Medical Image Computing and Computer Assisted Intervention* (**MICCAI**), 2023.
- X. Yan‡, J. Naushad, S. Sun, H. Kun, H. Tang, D. Kong, H. Ma, **C. You**, and X. Xie, "Representation Recovering for Self-Supervised Pre-training on Medical Images", *IEEE Winter Conference on Applications of Computer Vision* (**WACV**), 2023.

Deep Learning for Medical Image Analysis

- X. Yan‡, S. Sun‡, K, Han‡, T. Le, H. Ma, **C. You**, X. Xie, "AFTer-SAM: Adapting SAM with Axial Fusion Transformer for Medical Imaging Segmentation", To Appear, *IEEE Winter Conference on Applications of Computer Vision* (**WACV**), 2024.
- K, Han‡, S. Sun‡, T. Le, X. Yan, H. Ma, **C. You**, X. Xie, "Hybrid Neural Diffeomorphic Flow for Shape Representation and Generation via Triplane", To Appear, *IEEE Winter Conference on Applications of Computer Vision* (**WACV**), 2024.
- K. Han‡, S. Sun‡, X. Yan‡, **C. You**, H. Tang, J. Naushad, H. Ma, D. Kong, and X. Xie, "Diffeomorphic Image Registration with Neural Velocity Field", *IEEE Winter Conference on Applications of Computer Vision* (**WACV**), 2023.

- K. Han[‡], Y. Xiong[‡], **C. You**, P. Khosravi, S. Sun, X. Yan, JS. Duncan, and X. Xie, "MedGen3D: A Deep Generative Framework for Paired 3D Image and Mask Generation", *International Conference on Medical Image Computing and Computer Assisted Intervention* (**MICCAI**), 2023.

Multi-Modal Data Analytics

- **C. You**, N. Chen, and Y. Zou, "Self-supervised Contrastive Cross-Modality Representation Learning for Spoken Question Answering", *Findings of the Conference on Empirical Methods in Natural Language Processing* (**EMNLP**), 2021.
- **C. You**, N. Chen, F. Liu, S. Ge, X. Wu, and Y. Zou, "End-to-end Spoken Conversational Question Answering: Task, Dataset and Model", *Findings of North American Chapter of the Association for Computational Linguistics* (**NAACL**), 2022.
- F. Liu[‡], T. Zhu, X. Wu, B. Yang, **C. You**, C. Wang, L. Lu, Z. Liu, Y. Zheng, X. Sun, Y. Yang, and DA. Clifton, "A Large Language Modelling Deep Learning Framework for the Next Pandemic", *npj Digital Medicine* (**NPJ Digit. Med.**), 2023.

Medical Natural Language Processing

- F. Liu[*‡], B. Yang[*‡], **C. You**, X. Wu, S. Ge, Z. Liu, X. Sun, Y. Yang, DA. Clifton, "Retrieve, Reason, and Refine: Generating Accurate and Faithful Patient Instructions", *Advances in Neural Information Processing Systems* (**NeurIPS**), 2022.
- J. Liu[‡], P. Zhou[‡], Y. Hua, D. Chong, Z. Tian, A. Liu, H. Wang, **C. You**, Z. Guo, Z. Lei, and ML. Li, "Benchmarking Large Language Models on CMExam – A Comprehensive Chinese Medical Exam Dataset", *Advances in Neural Information Processing Systems Datasets and Benchmarks Track* (**NeurIPS**), 2023.

Medical Image Reconstruction (with System/Hardware Design)

- **C. You**, Q. Yang, H. Shan, L. Gjesteby, G. Li, S. Ju, Z. Zhang, Z. Zhao, Y. Zhang, W. Cong, and G. Wang, "CT super-resolution GAN constrained by the identical, residual, and cycle learning ensemble (GAN-CIRCLE)", *IEEE Transactions on Medical Imaging* (**TMI**), 2019.
- G. Li, S. Luo, **C. You**, M. Getzin, L. Zheng, G. Wang, and N. Gu, "A novel calibration method incorporating nonlinear optimization and ball-bearing markers for cone-beam CT with a parameterized trajectory", *Medical Physics* (**Med. Phys.**), 2019.

Selected Presentations

Invited Talks at Universities

- CS & ECE Department, University of Virginia — Jan 2024
- ECE Department, UC Davis — Dec 2023
- BME & ECE & CISE Department, University of Florida — Oct 2023
- ECE Department, University of British Columbia — Sep 2023
- ICS Department, UC Irvine — June 2023
- Suzhou Institute for Advanced Study, USTC — Nov 2022
- ECE Department, Peking University Shenzhen — Jan 2022
- Department of Machine Intelligence, Peking University — Sept 2021
- ECE & CS Departments, UT Austin — Mar 2021

Invited Talks at Government Labs, Companies and Research Institutions

- Allen Institute for AI, Seattle, WA — Dec 2022
- Google Research, Mountain View, CA — Nov 2022
- Meta Fundamental AI Research (FAIR), New York, NY — Aug 2022
- Tencent AI Lab, Palo Alto, CA — Jul 2020

Keynote/Invited Talks at Conferences and Workshops

- MICCAI FLARE Challenge, Vancouver, BC, Canada — Oct 2023

Selected Patents

"CT super-resolution GAN constrained by the identical, residual and cycle learning ensemble (GAN-CIRCLE)", *US Patent Number:* US20220230278A1 (Granted, 07/2022).

Advising and Mentorship

Visiting scholars

- Fenglin Liu, M.S. student, ECE@Peking University
  Next: Ph.D. at University of Oxford, UK — Feb 2020 - May 2021
- Ruihan Zhao, B.S.&M.S. student, CS@UC Berkeley
  Next: Ph.D. at UT Austin — Nov 2020 - May 2022
- Nuo Chen, M.S. student, ECE@Peking University
  Next: Ph.D. at HKUST — Dec 2019 - May 2021
- Weicheng Dai, M.S. student, CS@New York University
  Next: postgraduate at Yale Medicine → Ph.D. at BU — Jan 2022 - Present
- Luoyao Chen, M.S. student, CDS@New York University
  Next: Research Engineer@NYU Medicine — Jan 2022 - May 2023
- Qingcheng Zeng, Research Assistant, Medicine@Zhejiang University
  Next: Ph.D. @Northwestern — Oct 2021 - May 2022
- Zhuotong Cai, Ph.D. student, ECE@Xi'an Jiaotong University
  Next: Visiting Scholar@Yale Medicine — Nov 2022 - Mar 2024

High school interns

- Sanskriti Singh, BASIS Independent Silicon Valley — May 2023 - Present

Teaching

Instructor & Graduate Teaching Fellow:

- Yale EENG 202A: Communications, Computation, and Control — Fall 2020

Teaching Assistant (TA):

- RPI ENGR 2350 Embedded Control — Spring 2017
- RPI ECSE 2610: Computer Components and Operations — Fall 2016
- RPI MATH 4600: Advanced Calculus — Spring 2016
- RPI MATH 2010: Multivariable Calculus and Matrix Algebra — Fall 2015
- RPI CSCI 1100: Computer Science I — Spring 2015

Service

Conference Service

- Area Chair: MICCAI

Journal Reviewer

- Reviewer: TPAMI, TMI, MedIA, TIP, TNNLS, TBME, J-STSP, TASSP, JMI, *etc.*

Conference & Workshop Service

- Reviewer: ICML, NeurIPS, MICCAI, ICLR, CVPR, ICCV, ECCV, ACL, EMNLP, NAACL, AAAI, IJCAI, ACM-MM, WACV, BMVC, IPMI, MIDL, IPCAI, *etc.*