

Yuwen Chen

PhD Candidate in Electrical & Computer Engineering at Duke University | Machine Learning & Medical AI

+1 (412) 863-0565 | yuwen.chen@duke.edu | [Personal Website](#) | [Google Scholar](#) | [LinkedIn](#)

ABOUT ME

I am a machine learning researcher specializing in AI for healthcare, developing **vision-language models (VLMs)**, **agents**, **generative models**, and **foundation models** for medical image segmentation, translation, and generation. I have interned at Siemens Healthineers and collaborated with clinicians, engineers, and data scientists to translate advanced AI methods into real-world healthcare solutions across medical imaging and molecular sequence data.

EDUCATION

Duke University

Ph.D. in Electrical and Computer Engineering; GPA: 3.88/4.00

Durham, NC

Sep. 2023 - Expected Jun. 2028

Carnegie Mellon University

M.S. in Electrical and Computer Engineering; GPA: 3.98/4.00

Pittsburgh, PA

Sep. 2021 - May. 2023

Imperial College London

M.S. in Electrical and Electronic Engineering; GPA: 3.85/4.00

London, UK

Sep. 2020 - Sep. 2021

University of Nottingham

BEng in Electrical and Electronic Engineering; GPA: 3.90/4.00

Nottingham, UK

Sep. 2016 - July. 2020

INDUSTRY EXPERIENCE

Siemens Healthineers

Research Intern

Princeton, NJ

Jun. 2026 - Sep. 2026

- VLMs for 3D Interactive Segmentation:

- Developed a unified VLM assisted 3D interactive segmentation framework supporting click based interaction, text prompting, and hybrid refinement, outperforming previous state of the art interactive segmentation methods across diverse testbeds.
- Introduced an agent-assisted workflow for creating and sharing language instructions that describe target appearance, location, and anatomical relationships, enabling effective cross-anatomy generalization without anatomy-specific labels.
- Demonstrated the framework in practical tumor annotation workflows, significantly reducing tumor annotation time compared with manual segmentation.

- Foundation Models for Scalable 3D Image Segmentation:

- Developed Sieca3D, a scalable 3D segmentation framework that adapts DINOv3 and V-JEPA to volumetric medical imaging using frozen backbones and lightweight trainable modules.
- Achieved state of the art performance across 15 datasets spanning CT, CBCT, and MRI, from few shot to full data settings, with only 5M trainable parameters.

Johnson & Johnson Medical Device Shanghai

Technical Assistant Intern

Shanghai, China

Sep. 2020 - Jan. 2021

- Collaborated with Microsoft on medical software testing, providing detailed feedback that informed iterative product improvements.
- Participated a cloud-based system for medical data management, enhancing scalability and interoperability.

Hangzhou iCarforce Technologies Co., Ltd

Research Intern

Hangzhou, China

Jun. 2018 - Aug. 2018

- Deployed a smart contract system with frontend and backend components for commercial applications.
- Led a team to implement and test scalable smart contract solutions.

RESEARCH EXPERIENCE

Mazurowski's Lab, Duke University

Doctoral Researcher at Mazurowski Lab, *Duke AI Health Spark Initiative*

Durham, NC, US

Sep. 2023 - Now

- Supervisor: [Dr. Maciej A. Mazurowski](#)
- Key Skills: Foundation Models, Generative Models, Deep learning, Computer Vision

- Foundation models for medical imaging:

- Developed novel Short Long-term Memory Segment Anything Model 2 (SLM-SAM 2) to accelerate medical image annotation via robust label propagation, outperforming SAM 2 by 14% in Dice on 9 datasets across MRI, CT, and ultrasound video, reducing correction time by 60% (accepted by [IEEE TMI](#)).
- Performed a rapid, comprehensive [evaluation](#) of SAM 2 on 21 diverse medical imaging datasets, delivering an early and impactful benchmark for the field ([IEEE TBME](#)).
- Contributed to developing foundation segmentation models for [bone](#) (MIA 2025) and [muscle](#) in MRI.

- Generative models for medical imaging:

- Created [ContourDiff](#), a diffusion-based medical image translation framework that preserves anatomical structures via contour-guided generation, improving CT-MRI translation fidelity and segmentation by 17.4% in unpaired settings (accepted by MELBA).
- Built [SegGuidedDiff](#) (MICCAI 2024) for anatomically controllable medical image generation, introducing random mask-ablation and achieving state-of-the-art fidelity in breast MRI and abdominal CT.
- Collaborated [Fréchet Radiomic Distance \(FRD\)](#), clinically interpretable perceptual metric for medical imaging, outperforming task-agnostic metrics (e.g., FID) in OOD detection, image translation evaluation, and unconditional image generation, with superior sample-efficiency, and alignment with radiologist judgment.

Carnegie Mellon University

Approximately Correct Machine Intelligence (ACMI) Lab

Pittsburgh, PA

Jan. 2022 - May. 2023

◦ Supervisor: [Dr. Zachary Lipton](#)

- Machine Learning in Evolving Healthcare System

- Led the development of [EMDOT](#) (Evaluation on Medical Datasets Over Time), a back-testing framework for evaluating medical AI over time, revealing overestimation in time-agnostic evaluation and identifying adaptive training strategies for distributional shifts.
- Analyzed out-of-distribution momentum contrastive (MoCo) pretraining for limited-data medical domains (published in [Med-Neurips 2023](#)), showing anatomically related datasets can outperform ImageNet and match in-domain pretraining, and proposed a dataset similarity metric.

SELECTED PUBLICATIONS (SEE FULL LIST ON GOOGLE SCHOLAR)

- *Accelerating Volumetric Medical Image Annotation via Short-Long Memory SAM 2*
Chen, Y., Yildiz, Z., Li, Q., et al. *IEEE Transactions on Medical Imaging (IEEE TMI)*
- *Contourdiff: Unpaired image translation with contour-guided diffusion models*
Chen, Y., Konz, N., Gu, H., et al. *Machine Learning for Biomedical Imaging (MELBA)*
- **[Co-first]** *Evaluating model performance in medical datasets over time*
Helen, Z., **Chen, Y.**, Lipton, Z., et al. *Conference on Health, Inference, and Learning 2023*
- *MoCo-Transfer: Investigating out-of-distribution contrastive learning for limited-data domains*
Chen, Y., Helen, Z., Lipton, Z., et al. *Medical Imaging meets NeurIPS 2023*
- *Smart-Plexer: a breakthrough workflow for hybrid development of multiplex PCR assays*
Miglietta, L., **Chen, Y.**, Luo, Z., et al. *Nature Communications Biology*

RESEARCH IN PROGRESS

Semi-supervised learning for MRI Fat Segmentation

Jul. 2025 - now

- Integrate Mean Teacher with nnUNet for fat segmentation across different MRI sequences and body locations.
- Formulate a fast data annotation pipeline with active learning using SLM-SAM 2.

Controllable Generative Model to Enhance Medical Image Segmentation

Jun. 2025 - now

- Create conditional diffusion models (e.g., text-guided) to generate image-mask pairs for data augmentation.
- Integrate a self-prompting strategy for advanced medical image segmentation.

AWARDS AND SCHOLARSHIPS

NIH/NIBIB Research Funding, Duke University

Jun 2024 - Present

Research supported by the National Institutes of Health under Award Number R01EB031575.

Outstanding Student Award, University of Nottingham

Sep. 2017 - May. 2018

Top 1% undergraduates

SKILLS

Technical Skills: PyTorch, Python, Slurm, Linux, Matlab, C, C++, Numpy, Scikit-learn, LaTeX, MONAI, OpenCV, 3D Slicer, Jupyter, Git

AI Development Tools: Claude Code, OpenAI Codex, ChatGPT, Cursor, GitHub Copilot

Professional Skills: Demonstrated **mentorship** in multiple teaching assistant roles at CMU and Duke. Experienced in NIH R01 **grant writing**. Adept at **leading and managing** projects involving multi-source imaging analysis pipelines to ensure timely outcomes. Proficient in **communicating** complex technical work to diverse audiences, connecting clinical requirements with AI-driven solutions.