Thomas G. DeSilvio | PhD Candidate in Biomedical Engineering

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ACADEMIC EXPERIENCE

Case Western Reserve University, Cleveland, OH

Graduate Student Researcher — ***08/2020 – CURRENT***

- 15+ peer-reviewed publications (Frontiers in Medicine, MICCAI, SPIE Medical Imaging, Nature Methods, RSNA), over $125,000 in research funding, and 3 patents in deep learning (DL) and machine learning (ML) for medical imaging analysis
  - Co-inventor of *Hybrid Convolutional Wavelet Networks for Predicting Treatment Response via Radiological Images of Bowel Disease*. U.S. Patent US-20230267607-A1. Issued August 24, 2023.
  - Co-inventor of *Computerized Features of Tumor Diversity on MRI Are Associated with Pathologic Response in Rectal Cancers*. Filed November 27, 2024. Patent Application Number 18/961,553. Patent Pending.
  - Co-inventor of *Integrated self-configuring and foundational deep learning segmentation models for localizing and segmenting the anal sphincter complex and perianal fistulas on pelvic MRI*. Filed February 2025. Patient Pending.
- Engineered novel human-in-the-loop DL model for multi-view segmentation of rectal cancers on multi-institutional MRI
- Introduced novel wavelet-based CNNs in PyTorch and multi-plane radiomics to classify treatment response in rectal cancers on MRI
- Assisted in validation of landmark-based radiology-pathology fusion framework to precisely localize pathologies on imaging after treatment
- Collaborated with Microsoft Al Research to (1) validate their open-source, pan-cancer detection model and (2) enable scalable deployment of lab's DL cancer detection pipelines via distributed GPU computing in Azure
- Teacher assistant for 50+ graduate students in Medical Imaging Processing (Spring 2023-2024) & AI in Medical Imaging (Fall 2024)
- Mentored 25+ high school, undergraduate, graduate, and medical students in building supervised ML algorithms for medical image analysis

High Performance Computing Cluster (HPCC) Administrator — ***08/2020 – CURRENT***

- Maintained and optimized 4 on-premises, Linux-based servers with NVIDIA GPU for intensive DL workflows and big data processing
- Primary liaison for facilitating 80+ lab members utilization of CWRU's scalable HPCC for DL/ML pipelines
- Diligently managing an extensive 130+ TB dataset of medical imaging data (radiology and pathology) on Linux servers

Stanford University, Palo Alto, CA — ***05/2020 – 08/2020***

Canary Cancer Center Research Intern

- Developed state-of-the-art generative AI models for normalizing intensity distributions on MRI to improve early detection of prostate cancer
- Collaborated closely with urologists to rigorously validate generative-based enhancement of multi-modal prostate MRI

PROFESSIONAL EXPERIENCE

Inari Medical, Cambridge, MA — ***05/2024 – 08/2024***

AI/ML Applied Scientist Intern

- Proposed feature engineering solutions to provide comprehensive overview of blood vessel environment in intravascular ultrasound (IVUS)
- Provided recommendations of different ML-based SLAM methods for 3D reconstruction of IVUS
- Trained and validated YOLO-based segmentation model for IVUS via AWS EC2 instances
- Collaborated with software engineering team to strategize deployment of ML and DL models on edge devices in clinical workflows

Business Technology Services Inc., Twinsburg, OH — ***06/2016 – CURRENT***

Part-time I.T. Consultant

- Created 10+ custom Amazon Alexa Skills via Amazon Web Services (AWS) for laboratory casework companies and major sports arenas
- Designed and administered 2 Wordpress intranets used by 1000+ educational providers for internal documents and trainings
- Implemented and managed payroll system via Zoho Creator Databases, saving $7k -$9k per month and reduced controller's processes by 2 days
- Worked closely with construction and education clients to provide high-quality, on-site and virtual I.T. technical support

TECHNICAL SKILLS

Python	Deep Learning	High Performance/Distributed Computing	MATLAB	Medical Image Analysis
PyTorch	Computer Vision	Big Data Analytics and Visualization	R	Feature Engineering

EDUCATION

Ph.D. Biomedical Engineering	Case Western Reserve University, Cleveland, OH	***08/2020 - EXPECTED in 06/2025***
B.S. Biology	Xavier University, Cincinnati, OH	***12/2018***
B.A. Computer Science	Xavier University, Cincinnati, OH	***12/2018***