

Nick DiSanto

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RESEARCH INTERESTS

Computer Vision & Machine Learning: image restoration and reconstruction, 3D vision, neural representations, generative modeling, and representation learning

EDUCATION

Vanderbilt University

Jan. 2025 – Present

Ph.D. in Computer Science, expected 2029

GPA: 3.96/4.0. Advised by Dr. Ipek Oguz. Research affiliated with VISE.

California Baptist University

Aug. 2019 – Apr. 2023

B.S. in Computer Science, summa cum laude

GPA: 4.0/4.0. Ranked #1 in graduating class.

RESEARCH EXPERIENCE

Vanderbilt Medical Image Computing Lab (MedICL)

Jan. 2025 – Present

Graduate Student Researcher

- Developing deep learning methods for **3D image restoration, reconstruction, and registration** from incomplete or motion-corrupted observations, emphasizing recovery of volumetric structure under limited supervision
- Investigating **implicit neural representations (INRs)** for underconstrained 3D reconstruction, comparing Fourier-feature MLPs, SIRENs, and multiresolution hash grids to study how coordinate encoding, spectral bias, and optimization affect extrapolation into unobserved regions
- Developed a framework for lifting **frozen 2D inpainting priors to 3D volumetric restoration** through reconstruction across depth, analyzing how orientation and cross-slice redundancy affect volumetric consistency
- Designed **VAMOS-OCTA**, a vessel-aware multi-axis supervision framework for 3D OCTA restoration; first-author work received the **Best Student Paper Award** and an **Oral Deep-Dive** at SPIE Medical Imaging 2026

CalBaptist ML & NLP Lab

Jan. 2022 – Dec. 2023

Lead Undergraduate Researcher

- Led **three research projects** end-to-end, from conception through implementation, analysis, and scientific writing
- Developed representation learning methods for large-scale geospatial social media data; in separate medical imaging work, designed contextual augmentation methods to improve generalization of classification models

PUBLICATIONS & MANUSCRIPTS

VAMOS-OCTA: Vessel-Aware Multi-Axis Orthogonal Supervision for Inpainting Motion-Corrupted OCT Angiography Volumes

N DiSanto, EK Aghdam, H Liu, JJ Watson, YK Tao, H Li, I Oguz.

SPIE Medical Imaging, 2026. [\[Best Student Paper\]](#) [\[Oral Deep-Dive\]](#) [\[pdf\]](#) [\[code\]](#)

Reorienting 2D Inpainting for Robust Volumetric OCTA Restoration

N DiSanto, JJ Watson, YK Tao, I Oguz.

Submitted to SPIE Medical Imaging, 2027. [\[code\]](#)

VFMStitch: A Vision-Foundation-Model Empowered Framework for 3D Ultrasound Stitching via Geometric-Semantic Feature Fusion

X Yao, N DiSanto, R Yu, J Wang, D Lu, G Arenas, B Oguz, A Pouch, N Schwartz, BC Byram, I Oguz.

Medical Imaging with Deep Learning (MIDL), 2026. [\[pdf\]](#) [\[code\]](#)

Monocular Absolute Depth Estimation from Endoscopy via Domain-Invariant Feature Learning and Latent Consistency

H Li, D Lu, J d'Almeida, D Isik, EK Aghdam, N DiSanto, A Acar, S Sharma, JY Wu, RJ Webster III, I Oguz.

SPIE Medical Imaging, 2026. [\[Oral\]](#) [\[pdf\]](#) [\[code\]](#)

From Geometry to Intensity: A Coarse-to-Fine Pipeline for Unsupervised 3D Ultrasound Stitching

X Yao, R Yu, D Lu, N DiSanto, EK Aghdam, KJ Oguine, G Arenas, B Oguz, A Pouch, N Schwartz, B Byram, I Oguz.

SPIE Medical Imaging, 2026. [\[pdf\]](#)

A Benchmark Study of Methods for Surgical Instrument Segmentation in Central Airway Endoscopy

D Isik, KJ Oguine, **N DiSanto**, J d’Almeida, RJ Webster III, I Oguz, H Li.
SPIE Medical Imaging, 2026. [\[Best Poster: Honorable Mention\]](#) [\[paper\]](#)

LOTUS: Latent Outpainting Diffusion Model for Three-Dimensional Ultrasound Stitching

X Yao, R Yu, **N DiSanto**, E Aghdam, KJ Oguine, D Lu, A Lou, J Wang, D Hu, G Arenas, B Oguz, A Pouch, N Schwartz, B Byram, I Oguz.
Medical Imaging with Deep Learning (MIDL), 2025. [\[Oral\]](#) [\[Spotlight\]](#) [\[pdf\]](#) [\[code\]](#)

Spatial Analysis of Social Media’s Proxies for Human Emotion and Cognition

A Corso, **N DiSanto**, N Corso, E Lee.
International Conference on Information, 2024.

TECHNICAL SKILLS

Programming: Python, C++, Java, SQL, Bash
ML & GPU Computing: PyTorch, NumPy/SciPy, scikit-learn, OpenCV, CUDA, multi-GPU training/profiling
Systems & Infrastructure: Linux, SLURM, Git, Docker, Kubernetes, GitHub Actions, AWS/GCP/Azure

INDUSTRY EXPERIENCE

GE Vernova Dec. 2023 – Jan. 2025
Software Engineer

- Led the technical roadmap and end-to-end development of **Disruption Prepare’s wildfire risk forecasting capability**, taking it from a local GIS prototype to production and building automated geospatial pipelines around satellite overpasses and NASA hotspots, NIFC wildfire reports, weather forecasts, and power grid asset data
- Formulated a **proxy-labeling strategy with limited labels**, using confirmed satellite hotspots as positives and transient hotspots as negatives; trained models for asset-level risk from environmental and grid conditions
- Co-developed with Microsoft an **LLM-based risk synthesis layer within Disruption Prepare**, combining model outputs and context into interpretable wildfire risk scores; used prior predictions to improve temporal stability
- Contributed to **satellite imagery analytics for vegetation risk** in Visual Intelligence, developing classifiers to distinguish dry vegetation and evaluating spatial granularity for vegetation encroachment analysis
- Co-led an early **AI-assisted software development evaluation and adoption initiative** with dozens of senior developers and presented a live demo at a CEO-led company all-hands; the initiative received full funding, and my work was recognized with a **2024 GE Vernova Changemaker Award (selected from 1,200 nominees)**
- Mentored two undergraduate SWE interns, including sprint planning, code review, and technical guidance

General Electric Jun – Aug 2022; Jun – Aug 2023
Software Engineering Intern

- Built and deployed a **containerized data ingestion pipeline for industrial sensor data**, processing raw telemetry into team-specific outputs for downstream systems across different organizations
- Maintained and optimized **production data ingestion microservices** and containerized deployment pipelines

Keysight Technologies Jun. 2021 – Aug. 2021
Software Engineering Intern

- Built an internal team portal centralizing documentation, training materials, and shared resources
- Developed customer-facing **product configuration interfaces in Oracle CPQ/BML** and analyzed configuration logic to consolidate redundant options, reducing unnecessary configurations by **40%**

TEACHING & MENTORING

California Baptist University 2021 – 2023
Teaching Assistant / Tutor
Intro to C++, Discrete Structures, Algorithms, Computer Architecture, Physics for Engineers.

AWARDS & HONORS

SPIE Medical Imaging Best Student Paper Award Feb. 2026
GE Vernova Changemaker — selected from 1,200 nominees Nov. 2024
Computer Science Outstanding Student Award Apr. 2023
Alpha Chi Honor Society — inducted among top 10% of students Apr. 2022
Engineering Excellence Scholarship Jan. 2021 – Apr. 2023