

TRISTAN HANSEN

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ML Engineer who built large-scale medical imaging infrastructure at Mayo Clinic, from distributed GPU pipelines processing 20+ TB of data to HIPAA-compliant anonymization systems. Freelance technical artist shipping commercial shader products for real-time VR applications. Broad expertise across computer vision, data engineering, and real-time GPU programming.

PROFESSIONAL EXPERIENCE

Machine Learning Engineer | Mayo Clinic Hospital

August 2023 - Present

- Published first-author paper on a 756,000+ image breast ultrasound dataset and processing pipeline.
- Engineered distributed training systems on GCP to process 20+ terabytes of imaging data across GPU clusters.
- Built serverless DICOM download pipeline using Cloud Run, Pub/Sub, and FastAPI with auto-scaling on GCP.
- Implemented HIPAA-compliant anonymization pipeline using NIST encryption and custom OCR systems.
- Deployed Dockerized clinical tool (FastAPI + Next.js) for prediction and radiologist annotation workflows.
- Implemented Gemini 2.5 Flash batch pipeline to parse 200K+ radiology reports into structured JSON.

Research Assistant | University of Wisconsin - La Crosse

January 2023 - August 2023

- Designed normalized SQLite schema (9+ tables) managing image metadata, lesion annotations, and pathology.
 - Trained U-Net for ultrasound field-of-view segmentation, achieving >96% IoU across scanner types.
 - Generated pathology-verified ground truth labels for 79,000+ unique breasts spanning 23 years of data.
 - Implemented Noise2Noise inpainting for automated caliper removal, achieving 28.36 dB PSNR and 0.9866 SSIM.
 - Implemented multithreaded database processing, reducing pipeline runtime by 88%.
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PERSONAL PROJECTS

Shader Developer, [Gumroad](https://gumroad.com)

June 2023 - Present

- Achieved 1,000+ sales and 300,000+ views within 1 year as a freelance HLSL Shader Developer.
- Maintained a 5-star rating with 37.7% repeat business.
- Optimized shaders for PCVR and Quest applications, achieving latencies of 5 ms for real-time 3D raymarching.
- Built audiolabs.dev, a browser-based music visualizer with a custom real-time DFT audio pipeline.

Game Developer, [Steam](https://steam.com)

January 2022 - April 2023

- Independently developed, designed, and published *Parametric Engine*, a mathematical art Unity Steam game.
 - Created a 12 mo. development roadmap, ensuring timely delivery of features and meeting all project milestones.
 - Implemented a JIT compilation system, improving performance by 7x.
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AREAS OF EXPERTISE & SKILLS

Skills: Distributed Training | Data Modeling | Generative Models | Project Management | Computer Vision | MLOps
Object Detection | Machine Learning | Data Pipelining | Cloud Computing | HIPAA Compliance | Medical Tools

Tools: Python | C# | C | R | HLSL | Java | SQL | Docker | Pytorch | Tensorflow | Keras | Matplotlib | BigQuery | Pandas
OpenCV | SPSS | DICOM | RStudio | Unity | Git | Linux | GCP | AWS | AI Factory | Snowflake | YOLO | Scikit-learn

EDUCATION

Bachelor of Science in Computer Science | University of Wisconsin - La Crosse

July 2024