Jason Luce

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Professional Summary

Clinical AI & Applied Machine Learning scientist with 4+ years of experience developing deep learning systems for healthcare, medical imaging, and radiotherapy. Expertise in CNNs, U-Net, GANs, and model-observer networks for reconstruction, denoising, and image-quality prediction. Proficient in Python, PyTorch, and HPC-scale training workflows. Published in *Medical Physics, Frontiers in Oncology, and JACMP*. Excited about building safe, reliable, and clinically aligned AI systems that improve health care workflows and patient care.

Technical Skills

- **Deep Learning & Computer Vison:** CNNs, U-Net, GANs, Autoencoders, Image Reconstruction, Denoising, Bone Suppression
- **Domain Expertise:** Radiotherapy Imaging, DICOM
- **Libraries & Frameworks:** PyTorch, TensorFlow, NumPy, pandas, scikit-learn
- **Languages:** Python, C++, MATLAB
- **Tools & Environments:** Linux, CUDA, HPC, Git, Jupyter

Professional Experience

Research Assistant – Department of Radiation Oncology, Loyola Medical Center, Maywood, IL (2021 – Present)
-Developed a U-Net for bone-suppressed image synthesis to support real-time markerless lung tumor tracking; demonstrated equivalent tracking accuracy to conventional bone-suppressed images and validated on more than 7,000 image pairs from a phantom and 20 patients (*Medical Physics*, 2025).
- Implemented CNN-based model observers that predicted Likert-scale image-quality scores with agreement comparable to expert raters.
- Collaborated with Varian Medical Systems on dual-energy imaging and scatter-reduction research, contributing to multiple peer-reviewed publications.
- Designed and maintained high-performance training workflows (multi-GPU, 50+ GB datasets) using PyTorch, CUDA, and Linux HPC clusters.

Graduate Researcher – Materials Science & Engineering, University of Michigan, Ann Arbor, MI (2013 – 2021)
- Extended the Structural Phase-Field Crystal (XPFC) model for simulating grain boundary formation in HCP materials (Mg, Ti).

- Optimized and parallelized C++ and MPI code for multi-scale simulations, reducing runtime by more than 40%.
- Co-authored JOM (2018) and presented results at APS and MRS meetings.

Medical Imaging Research Intern – Loyola University Medical Center, Maywood, IL (2011 – 2013)
- Developed FFT-based image registration algorithm for radiotherapy alignment; achieved less than 0.1 mm mean registration error (IJMPCERO 2014).
- Created MATLAB and IDL tools for quantitative image analysis across multiple oncology studies.

Selected Publications

- Luce J., et al. "Use of a Deep Learning Neural Network to Generate Bone-Suppressed Images for Markerless Lung Tumor Tracking." Medical Physics, 2025.
- Kaur M., Luce J., et al. "Effect of Scattered Megavoltage X-rays on Markerless Tumor Tracking Using Dual-Energy Imaging." JACMP, 2023.
- Keeler A., Luce J., et al. "TIGRE-DE for the Creation of Virtual Monoenergetic Images from Dual-Energy CBCT." Medical Physics, 2024.
- Nguyen H., Luce J., et al. "Evaluation of Novel Detector Readout Modes for MV Scatter Reduction on kV Images." Medical Physics, 2025.

Education

- Ph.D., Computer Science, Loyola University, Chicago, IL (expected completion 2027)
    - Relevant coursework: Deep Learning, Natural Language Processing, Large Language Models, Machine Learning Systems
- M.S., Materials Science & Engineering, University of Michigan, Ann Arbor, MI (2016)
- B.S., Physics/Math & Computer Science, DePaul University, Chicago, IL (2013), Summa Cum Laude

Honors and Awards

Rollin M. Gerstacker Fellowship (University of Michigan)
Frank P. & Rita Frichle Scholarship (DePaul University)
Air Medal and Aerial Achievement Medal (U.S. Air Force)