REZA KALANTAR, Ph.D.

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Summary

Machine Learning Scientist with 6+ years of experience in deep learning for medical imaging, multimodal learning, and generative modeling. Ph.D. in Medical AI with a strong focus on real-world applications of transformers, diffusion models, denoising, synthesis, registration, and segmentation across 2D and 3D imaging modalities. Proven track record of building AI pipelines, integrating pre-trained and adaptive vision models, and aligning image representations with clinical endpoints. Experienced in developing and deploying AI systems in GPU-accelerated cloud environments, collaborating with cross-disciplinary teams, and leading projects from prototype to production. Passionate about leveraging machine learning and computer vision to develop cutting-edge solutions that drive technological and societal impact.

Skills

- **Languages & Tools:** Python, C++, Shell, MATLAB, Swift, Git, Docker
- **ML Frameworks:** PyTorch, MONAI, Hugging Face, TensorFlow, OpenCV, Scikit-Learn
- **Modeling:** Vision Transformers, Diffusion Models, Autoencoders, CNNs, GANs, VAEs, Contrastive Learning
- **Data & Visualization:** Pandas, NumPy, Seaborn, SQL, NIfTI, DICOM, multidimensional data handling
- **Data Ops:** Ingestion, preprocessing, augmentation pipelines for large 3D image datasets, DVC
- **Deployment:** Multi-GPU training, distributed inference, cloud services (Azure)

Experience

MVision AI — London, United Kingdom
Machine Learning Researcher — Dec 2023 - Present

• Led development of multimodal AI pipelines for real-time image registration and segmentation in cancer therapy.
• Developed and integrated foundational transformer models (Swin, TransMorph) for unsupervised registration and adaptive learning, achieving >90% accuracy on challenging clinical cases.
• Delivered 10x speedup in workflows via cloud-based deployment (Docker, Azure) and GPU acceleration.
• Collaborated cross-functionally to align model performance with clinical and operational requirements.

Key Project: Cloud-based Adaptive Registration for Oncology
• Conducted Research and development of key advancing literature for vision-based cancer treatment planning.
• Developed modular AI pipelines for perform real-time segmentation and image alignment on large datasets.

The Institute of Cancer Research — London, United Kingdom
Machine Learning Scientist — Oct 2019 – Apr 2023

• Developed a novel generalist multimodal segmentation pipeline using GANs, diffusion models, and transformers across pelvic cancers.
• Achieved 90% and 99% clinical acceptance for synthesis-guided and adapted segmentations on real-world data.
• Led 7+ publications in peer-reviewed journals; presented at ASTRO, MedAI, MIDL, ISMRM conferences.
• Designed synthetic data approaches to improve segmentation adaptation, enhancing model.

Key Project: Multimodal Foundation Pipeline for Synthesis-Segmentation
• Deployed vision transformers and generative models to improve segmentation in data-scarce domains.
• Benchmarked model performance on multimodal datasets, with >90% clinical acceptance.

Education

The Institute of Cancer Research, London, United Kingdom — Oct 2019 – Oct 2023
Ph.D. in Deep Learning in Cancer Imaging & Treatment

Imperial College London, United Kingdom — Sep 2018 – Sep 2019
MRes in Medical Robotics & Image-Guided Interventions – GPA: 4.0

Selected Publications

- Domain-Adaptive AI for Gynecologic Cancers, *Adv. Rad. Onc.* — Apr 2025
- MED-INPAINT: Image Synthesis using Multi-Level Inpainting & Adaptive Priors, *IEEE MedAI* — Nov 2023
- Framework with Multi-Head Dilated Encoders for Segmentation of Cervical Cancer, *Diagnostics* — Nov 2023

Awards and Scholarships

- Prestigious Ph.D. studentship (**~£140,000**) from the Institute of Cancer Research — Apr 2025
- **£12,000** postgraduate scholarship from Imperial College London — Nov 2023