



Radiology and Imaging Sciences
National Institutes of Health Clinical Center
U.S. Department of Health and Human Services



Post-Doctoral Fellowship Multi-Modal AI and Foundation Models for Precision Medicine

A post-doctoral fellowship is available in the Imaging Biomarkers and Computer-Aided Diagnosis laboratory at the NIH Clinical Center in Bethesda, Maryland, USA. The primary focus of the lab is the development and use of advanced computation methods for precision medicine. The lab routinely develops tools that integrate medical imaging (e.g., CT, MRI, PET/CT), reporting (e.g., radiology reports, clinical notes, histopathology report) and clinical tests (e.g., blood, organ function, urine tests) for computer-aided diagnosis. Examples of recent projects include automated assessment of body composition, cirrhosis of the liver, pancreas morphology in diabetes, and tumor burden in cancer patients.

Specific areas of interest include segmentation of organs and structures in the human body, anomaly detection, derivation of biomarkers for classification of diseases, and survival prediction. Techniques from classical computer vision and image analysis, such as registration/alignment of multi-modal data sources, are routinely combined with modern deep learning-based approaches (e.g., vision-language and large language models). Specific emphasis is placed on leveraging limited training data (through active/meta-/zero-/few-shot/unsupervised learning) and scaling approaches to hundreds of thousands of patients. Developed AI tools are routinely deployed within the clinical environment for real-world evidence generation and to inform the trajectory of patient therapy.

Candidates with backgrounds in machine/deep learning, computer vision, modeling, optimization, and statistics are sought. Fellows will work closely with staff scientists and practicing clinicians. The Clinical Center is America's premier research hospital (also known as the "House of Hope") and fellows will have access to data acquired by state-of-the-art whole body CT, MRI, MRI-PET, and PET-CT scanners. Previous fellows have benefited from a thorough introduction to the radiology workflow and will have the opportunity to shadow practicing radiologists. They will also have access to the NIH's flagship high performance computing cluster (Biowulf) and workstations with the latest GPUs for their research.

Basic Qualifications: Ph.D. in a computational field (Computer Science, Electrical Engineering, Biomedical Engineering, or related discipline with experience in Machine Learning, Computer Vision, or Image Processing), along with publications in top-tier conferences and journals.

Desirable Qualifications: Strong theoretical and practical background in machine/deep learning, computer vision, image or video analysis such as object detection and recognition, pattern recognition, sparse numerical methods for optimization, and statistics. Prior knowledge about medical imaging is a plus. Enthusiasm in solving real-world clinical imaging problems using peta-scale datasets is required. Hands-on coding skills in one or more of Python and modern deep learning frameworks (e.g., PyTorch) are required.

Typical fellowships are for 2-3 years, but longer ones are possible. Applications should include a CV, brief statement of research interests and three letters of reference. DHHS and NIH are Equal Opportunity Employers. U.S. and non-U.S. citizens and U.S. Permanent Residents will be considered.

Application Instructions:

Email application materials to Dr. Ronald Summers at rms@nih.gov.

Ronald Summers, M.D., Ph.D., FSAR, FAIMBE, FSPIE
Chief, Imaging Biomarkers and Computer-Aided Diagnosis Laboratory
Website: <https://www.cc.nih.gov/meet-our-doctors/rsummers.html>