DNAnexus®

MONAI: AI IMAGING ANALYSIS | SOLUTION BRIEF

MONAI: Enabling AI Imaging Analysis on the DNAnexus Platform

The Problem

Healthcare and life sciences organizations possess massive volumes of medical imaging data (MRI, CT, X-rays), yet analyzing this data to drive innovation is time-consuming and prone to errors.

Traditional image viewing and annotation methods require coding expertise or fragmented tooling, creating inefficiencies for researchers and clinicians alike.

Manually annotating metadata to train machine learning models is labor-intensive, significantly slowing the creation of high-quality datasets for AI development.

These challenges are compounded by the fact that setting up the necessary GPU-accelerated environments for deep learning on medical images is technically complex and expensive to maintain on-premise.

The Need:

Biopharma and research organizations require a centralized, secure platform that integrates powerful imaging analysis tools with multiomic data. There is a critical need for accessible toolsets that drive interactive engagement, enable the training of models to accelerate image-derived phenotype identification, and facilitate the review and scoring of those models across large datasets.

KEY TAKEAWAYS:

Streamline Annotation

Significantly reduce manual effort with AI-assisted labeling tools that continuously learn and improve.

Unified Environment

Analyze images, genomic data, and clinical phenotype data within a single, secure and compliant environment.

Scalable Compute

Leverage enterprise-grade GPU resources to train models and process large datasets without managing local hardware.
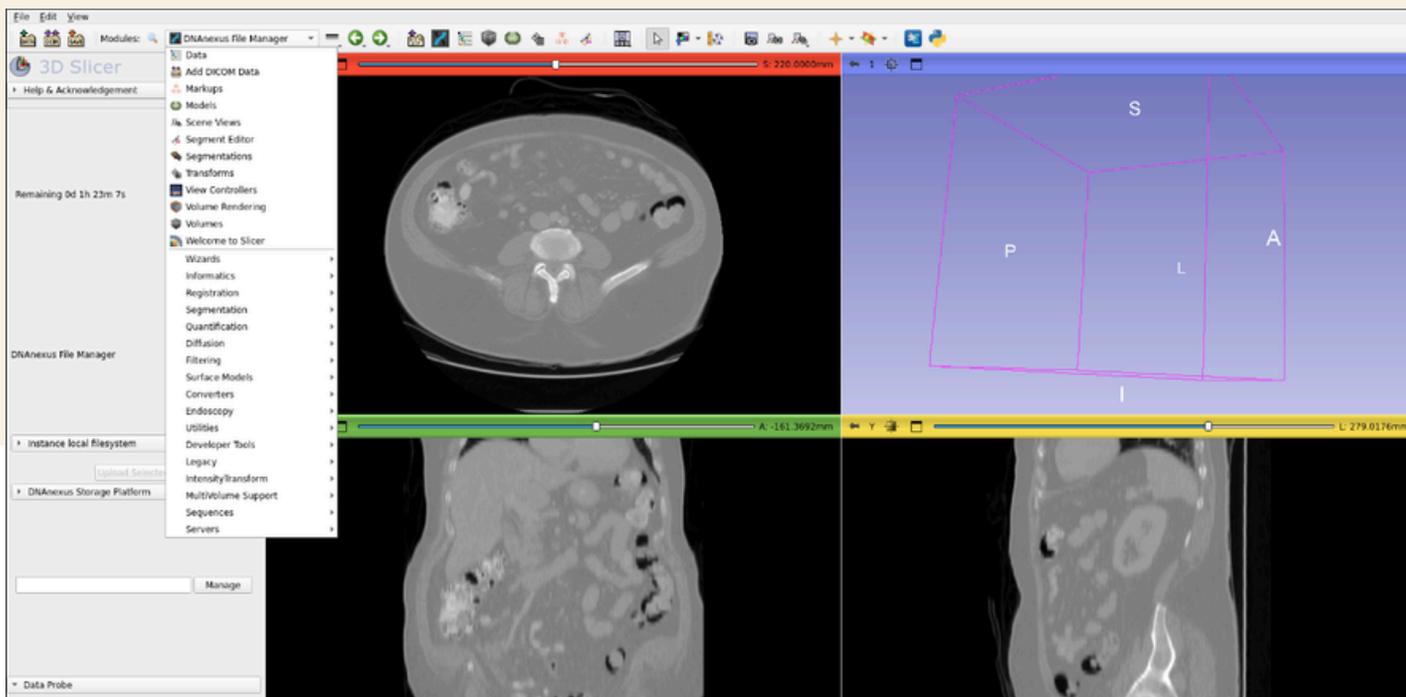
Our Solution

MONAI on DNAnexus provides a comprehensive ecosystem of AI tools for healthcare imaging, integrated directly into the DNAnexus platform. It combines the flexibility of MONAI Core for building and training models with the interactive power of MONAI Label and 3D Slicer for annotation and visualization.

Interactive AI-Assisted Annotation: Utilize MONAI Label in conjunction with 3D Slicer to reduce manual annotation time. Users can outline Regions of Interest (ROI) and label them manually or automatically using pre-trained models.

Flexible Model Training (MONAI Core): Access a library of tailored AI algorithms and pre-trained models (MONAI Model Zoo) specifically for medical imaging. Run scripts in a versatile, all-in-one app or use interactive JupyterLab notebooks for custom analysis.

Multi-Modal Integration: Seamlessly combine imaging data with genomics and clinical data (multiomics) to discover biomarkers and validate organ damage genetic predispositions.

Secure Collaboration: Perform secondary and tertiary analysis within the DNAnexus Trusted Research Environment (TRE), ensuring compliance with FedRAMP, HIPAA, and GDPR standards while collaborating with internal teams and external partners.

YOUR BENEFITS AND KEY OUTCOMES

Accelerate AI Development: Use active learning loops where user annotations immediately retrain and improve the underlying AI model, drastically shortening the time from data to inference.

Democratize Imaging AI: Remove technical barriers by providing a GUI-based interface (3D Slicer) for clinicians and radiologists, while offering JupyterLab and command-line tools for data scientists.

Cost-Efficient Scaling: Optimize costs by choosing between CPU for basic viewing and GPU-accelerated instances for intensive model training and inference.

End-to-End Workflow: Manage the full lifecycle—from data ingestion (DICOM/NIfTI) to annotation, model training, and deployment—all within the secure platform.