

Real-Time Restoration for Spectral Medical Imaging Systems Technology

Overview

Modern medical imaging devices—such as X-ray, MRI, CT, and ultrasound systems—generate high-resolution images critical for clinical decisions. These systems operate across varying conditions and are subject to motion, noise, and acquisition inconsistencies that can obscure vital detail. ProHawk AI delivers real-time, AI-enabled computer vision, pixel-by-pixel restoration across the electromagnetic spectrum, ensuring each scan or frame maintains its fidelity for downstream AI, visualization, or clinical review.

Built for NVIDIA's accelerated computing platform and integrated into NVIDIA Clara workflows, the ProHawk Vision GXF Operator brings GPU-powered restoration to the edge and cloud. Whether improving input for AI diagnostics, robotic workflows, or image archives, ProHawk ensures clarity and consistency at the point of capture.

Key Challenges

Each imaging modality presents unique challenges. X-rays and CT scans may suffer from noise, scatter artifacts, or motion blur. MRI systems are sensitive to signal interference and patient movement, while ultrasound often faces speckle noise, shadowing, and variability based on operator skill and angle. These issues reduce image clarity, hindering both clinical interpretation and AI-driven diagnostics.

Traditional filtering or post-processing techniques do not adapt in real time or preserve original data quality. To support accurate diagnostics, surgical planning, or AI inference, imagery must be restored dynamically—before analysis or display. Without a robust restoration layer, even advanced imaging systems can yield inconsistent or suboptimal results.

Key Benefits and Outcomes

ProHawk AI delivers real-time, pixel-level restoration across diverse medical imaging modalities—improving clarity, consistency, and diagnostic reliability for both clinicians and AI systems. Seamlessly integrated with NVIDIA Clara, it improves visualization, boosts AI model performance, and scales efficiently from edge devices to cloud-based healthcare infrastructure.

- **Spectral Restoration Agnostic to Modality**

ProHawk AI restores imagery across visible, acoustic, and radiographic domains—supporting ultrasound, X-ray, CT, MRI, and nuclear imaging inputs.

- **Pixel-Accurate Processing**

Operates on every image or video frame in real time, ensuring no loss of critical diagnostic detail.

- **Improved AI Inference Quality**

Delivers clearer input to AI and deep learning models, improving accuracy, speed, and clinical trust in AI-based tools.

- **Boosts Visualization**

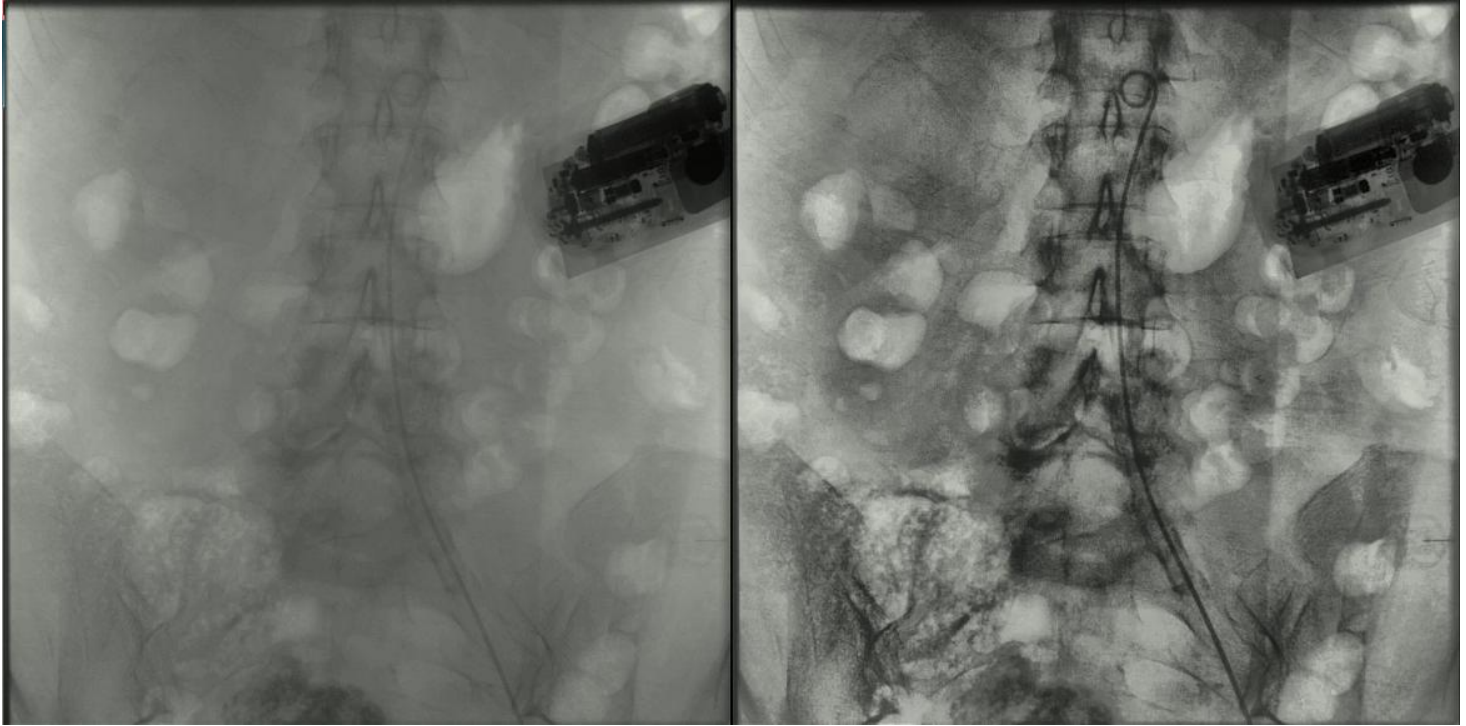
Restored clarity benefits radiologists, pathologists, and robotic-assisted surgeons with sharper, more usable data.

- **Seamless Integration with Clara**

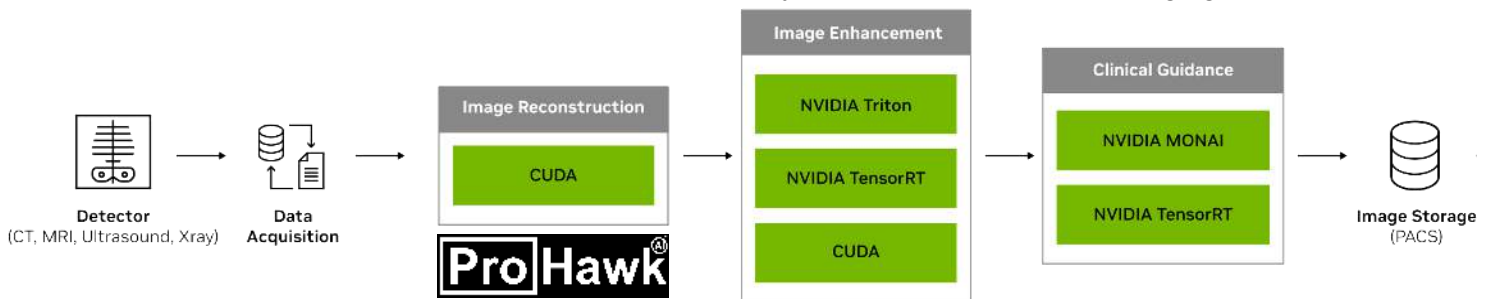
Runs inside NVIDIA Clara pipelines, accelerating deployment within regulated medical imaging workflows.

Accelerated Computing for Medical Video Innovation

The ProHawk Vision GXF Operator is purpose-built for NVIDIA Clara environments and optimized for multi-modal medical imaging. It applies patented restoration algorithms at the pixel level, using NVIDIA GPUs to correct distortion, normalize contrast, and remove environmental interference in real time. This ensures that every image—whether a single X-ray or a dynamic ultrasound stream—is processed before AI inference or clinician review.



Integrated with NVIDIA Clara workflows, the ProHawk Vision GXF Operator brings ultra-low latency and high-throughput performance to medical pipelines. It enhances diagnostic consistency, reduces review fatigue, and improves outcomes by giving radiologists and AI tools cleaner, more interpretable inputs. From edge capture devices to cloud-hosted archives, ProHawk AI ensures fidelity is preserved across the imaging continuum.



Validated through deployments and benchmark testing on standard GPU accelerated systems, ProHawk AI has demonstrated robust performance improvements as a foundational component in the Dell AI Factory with NVIDIA, in both NVIDIA's Metropolis Lab and Dell's Validation Lab:

- >300% Improved Object Detection & Tracking
- >30X Faster Video Stream Restoration
- 3-4X Clarity for Degraded Images
- <3 Milliseconds Latency

