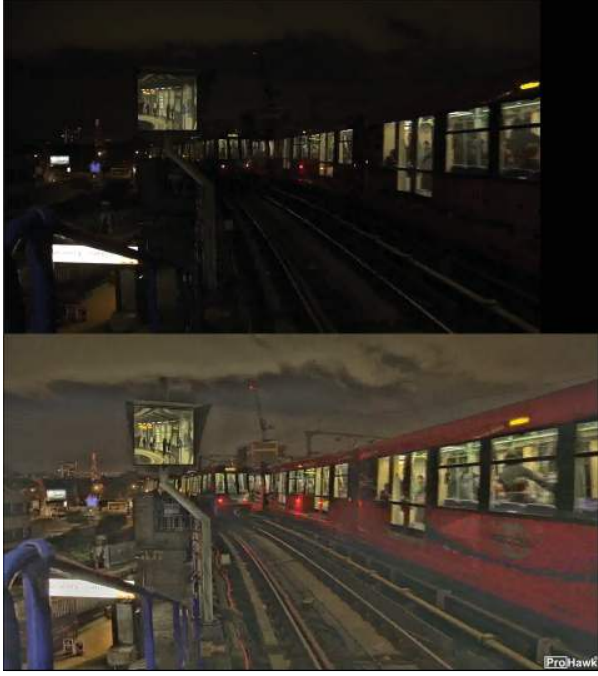
Solution Showcase

Computer Vision for Visibility Through Challenging Environments

ProHawk AI's Vision Platform, powered by NVIDIA Metropolis, brings clarity to degraded images for improved operations and security.



"The NVIDIA Metropolis edge-to-cloud platform for smart cities is ideal for integrating ProHawk Vision into Metropolis partner offerings in applications ranging from transportation to utilities to healthcare."

Robert Brown,
CEO, ProHawk AI

Organizations are increasingly turning to AI-powered video analytics to help monitor security and operational video streams. Most often, these AI solutions are trained on pristine imagery and unobscured objects. But real-world conditions like rain, fog, snow, glare, darkness, and a myriad of other issues compromise visibility and render AI systems blind. In these low-quality video scenarios, objects may not be detected or properly identified, resulting in inconsistent object tracking, low alarm accuracy, missed security breaches, and expensive false positives.

According to an analysis by the IEEE, reducing image classification errors by 50% requires 500X the computing power, placing accurate solutions out of reach of most organizations.

ProHawk AI's Vision Platform uses NVIDIA frameworks and parallel processing on NVIDIA GPUs to recapture clear video quality on live camera streams, video management system streams, and recorded video—even through challenging conditions.

ProHawk's Computer Vision Cuts Through the Fog

Driven by powerful computer vision (CV) algorithms, ProHawk Vision transforms noisy, obscured, or unclear video into sharp, clear, visible video with latency as low as two to four seconds.

While traditional solutions manipulate an entire image, ProHawk Vision reveals how each pixel is influenced by surrounding pixels based on light reflection particulate absorption, and lens refraction. The solution then dynamically adjusts pixels to produce images that both the human eye and AI systems can easily interpret.

ProHawk

ProHawk Vision™ uses advanced algorithms to bring superhuman performance to image and vision operations. The computer vision restoration solution restores live and recorded video streams through all conditions with sharp, clear, real-time processing of image data.

Industry

- Smart cities
- Public spaces
- Traffic management
- Campuses
- Sports venues
- Government facilities
- Factory floors

NVIDIA Preferred Partner

Enhanced business and security operations

Through deployments and benchmark testing on NVIDIA Metropolis Lab, ProHawk Vision has demonstrated robust performance improvements:

- 300% improved object detection and tracking accuracy
- 30X faster video stream restoration than conventional systems
- 3–4X more clarity for degraded visuals
- 3 milliseconds for enhanced latency

By solving for poor visibility conditions such as low light, haze, and obscured objects, ProHawk AI facilitates quick decision-making and response time without the need for additional equipment or staff. This helps organizations meet safety and security requirements, even in high-risk areas and challenging environments.

ProHawk AI computer vision improves operations in challenging visibility environments.

Safety and Security for Critical Infrastructure

A major utility provider in the state of Hawaii was expected to meet rigorous security and intrusion prevention standards to ensure the uninterrupted delivery of electricity to critical infrastructure. The many facilities that required enhanced security included offices, power-generation plants, substations, and more.

Even after upgrading its facilities with radar, camera telemetry, intrusion sensors, thermal cameras, and more, the natural environment presented remaining security challenges. Due to the hot and humid climate, thermal cameras often struggled to differentiate between body heat and ambient surroundings. Rain and fog reduced the effective range of safety cameras and night coverage was limited by the scope of infrared perimeter illuminators. With these difficult conditions, the utility couldn't always rely on visual confirmation of a threat.

To improve the visual quality of existing security and monitoring systems, the utility integrated ProHawk Vision with 800 existing security cameras and their video management systems.

ProHawk AI dramatically improved on-site situational awareness with cameras able to identify any attempted intrusion, even through challenging visibility conditions such as rain, fog, shadows, glare, and nighttime. More detailed images even made it possible to identify objects in people's hands and abandoned objects that could present a threat.

Benefits

- Enhances accuracy of object detection, recognition, and monitoring
- Improves employee safety
- Provides quick incident detection response
- Delivers real-time clarity through all conditions and obstacles
- Deploys anywhere, with no code

Results

- 300% improved object detection and tracking
- 30X faster video stream restoration
- 3–4X clarity for degraded images

NVIDIA Hardware

- NVIDIA L4, L40, A2000, RTX 6000, A6000, A16, A40, T4 GPUs
- Jetson AGX Orin™
- Jetson Orin NX™

NVIDIA Software

- NVIDIA DeepStream SDK
- NVIDIA® TensorRT™
- NVIDIA CUDA®
- NVIDIA EGX™

"ProHawk Vision's algorithms reveal each individual pixel's true representation based on the light, reflection and refraction of particulates, automatically producing live video that's intelligible for humans as well as for computers and AI."

Bob Brown,
CEO, ProHawk Technology Group, Inc.

“The ProHawk AI solution made an immediate impact, extending the analytic detection range of the thermal cameras threefold and infrared cameras fivefold.”

On-Site Security Operator

On-site security operators estimate that ProHawk AI technology will result in $7 million in savings by avoiding the need to buy new cameras and an additional $2 million in savings from reduced use of IR illuminators and other forms of perimeter lighting. Further savings will come from limiting false security alerts that needlessly consume resources.

By deploying ProHawk Vision, the utility company has enhanced the usability and reliability of its extensive safety systems while reducing costs and meeting the security expectations of customers.

SpaceX relies on ProHawk AI algorithms to see through fog, rain, and clouds of liquid oxygen. This helps minimize risk during launch operations at Vandenburg, Cape Canaveral, and Brownsville, TX launch sites.

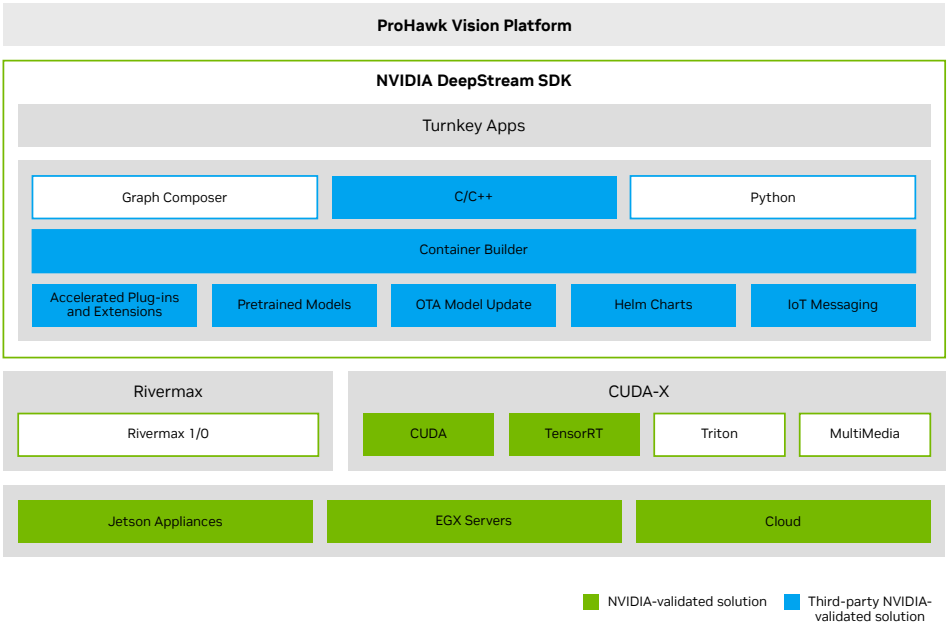
Powered by NVIDIA

ProHawk AI’s platform restores images before running them through inference pipelines that determine whether or not an intrusion is occurring. The result is a significant boost in accurate intrusion detection.

To achieve this, ProHawk AI relies on NVIDIA DeepStream as its inference pipeline to analyze video and sensor data in real time. The NVIDIA DeepStream SDK is a complete streaming analytics toolkit based on GStreamer for AI-based multi-sensor precessing, video, audio, and image understanding.

ProHawk also uses NVIDIA CUDA to access NVIDIA GPUs for developing, optimizing, and deploying its solution. The ProHawk AI Platform has been tested and validated to run on the NVIDIA Metropolis stack to ensure performance, and runs on NVIDIA Jetson™ and NVIDIA EGX™ hardware.

ProHawk AI on NVIDIA AI



NVIDIA AI Enterprise includes NVIDIA DeepStream to enable real-time analytics on video, image, and sensor data.

Deployable at the client, edge, server, or cloud level, ProHawk AI is bringing clarity back to vision operations. This empowers businesses to enhance security and safety while driving cost savings in smart spaces.

Ready to Get Started?

To learn more about NVIDIA solutions for smart spaces, visit: nvidia.com/smart-cities-and-spaces

To learn more about ProHawk's computer vision restoration, visit: prohawk.ai/

NVIDIA