



# How Computer Vision AI Drives Better Outcomes for Energy and Utility Companies

## Energy and Utility Industry Challenges

Computer vision AI offers a range of benefits for energy and utility companies, including improved safety, efficiency, and reliability across their operations. Analyzing images and video feeds from sensors, drones, and satellites, however, is often impeded by operational complexities, including the inability to interpret real-world, unconstrained environments where video and images are less than perfect.

Like humans, even the highest quality cameras and sensors don't see through night, fog, rain, snow, pollution, and other obstacles. And most often, computer vision AI solutions are trained on pristine imagery and unobscured objects.

## Why AI-Enabled Computer Vision

ProHawk AI addresses the challenges in viewing and acting on high and low-quality live videos due to environmental factors. Problems typically arise from two main sources: issues stemming from particulates of varying sizes that obstruct the view, and challenges related to lighting conditions, including both excess or insufficient light.

ProHawk's vision restoration solution uses NVIDIA frameworks and parallel processing on NVIDIA GPUs to restore clear video quality on live camera streams, video management system streams, and recorded video, through all challenging conditions.

## Key Benefits and Outcomes

Real-time monitoring with ProHawk AI Vision in the video workflow overcomes all visual environmental impediments to greatly increase object detection and enable decisive action at the decisive time and place.

- **Facility safety and security:** Detect security breaches, suspicious activities, fires, or other safety hazards at substations and other facilities in all weather and lighting conditions. Prevent accidents and improve overall safety for workers and the public and reduce false positives.
- **Predictive maintenance and fault detection:** Identify wear and tear, damage, and potential failures in equipment and infrastructure. This allows for proactive maintenance, preventing costly outages and repairs. For instance, detect vegetation overgrowth near power lines before it causes disruptions, and identify cracks, fissures, or other risks to pipes including underwater pipelines, to prevent leaks and avoid environmental problems.
- **Lower TCO of video infrastructure:** Streamline video analytics and reduce the time required to process (less than 3 msec) and analyze video data, critical for real-time decision-making. Existing cameras and sensor work better, and without the addition of lighting, delaying new capital expenditures for camera and lighting upgrades.

## Better Business Outcomes Powered by NVIDIA Accelerated Computing

By using accelerated computing solutions with NVIDIA GPUs, ProHawk Vision transforms video in real time, on a pixel-by-pixel basis, overcoming all environmental and lighting obstacles. While traditional solutions manipulate an entire image, ProHawk Vision reveals how each pixel is influenced by surrounding pixels based on light reflection and refraction of particulates. This produces live video streams and images that reveal previously unseen details for humans doing video analysis and for AI tools. Downstream video workflow processes and inferencing tools can then always perform at unobstructed, daytime safety levels.



ProHawk AI uses the NVIDIA Metropolis stack for computer vision AI deployments to analyze video and sensor data in real time. Validated through deployments and benchmark testing on standard GPU accelerated systems, ProHawk AI Vision has demonstrated robust performance improvements:

- 300% improved object detection and tracking accuracy
- 30X faster video stream restoration than conventional systems
- <3 milliseconds of latency

### Hawaiian Utility Case Study

**The Challenge:** Provide a major utility in Hawaii with a means to dramatically enhance usability and reliability of their extensive video security systems at the lowest possible cost.

**The Results:** Increased range of thermal camera analytics by 3 times, infrared camera analytics by 5 times.

**Solution Integrator:** The ProHawk solution made an immediate impact, extending the analytic detection range of the thermal cameras by 3 times and their infrared cameras by 5 times. Situational awareness at the customer site was dramatically improved, as their cameras could now accurately identify any attempted intrusion, even in rainy conditions, fog, shadows cast during bright sunshine, nighttime, or sun glare. It also greatly enhanced basic imagery under normal lighting conditions, making it possible to see fine details, such as specific individuals, small objects in people's hands, as well as objects that may have been left near the facility which could present a threat.

Overall, computer vision restoration from ProHawk AI empowers energy and utility companies to:

- **Enhance safety and security:** By proactively identifying and addressing potential risks.
- **Reduce costs:** Through proactive maintenance, fewer outages, eliminating illumination lighting upgrades.
- **Improve reliability:** By predicting and preventing problems that can disrupt service.
- **Boost customer satisfaction:** With faster response times and improved service accuracy.