

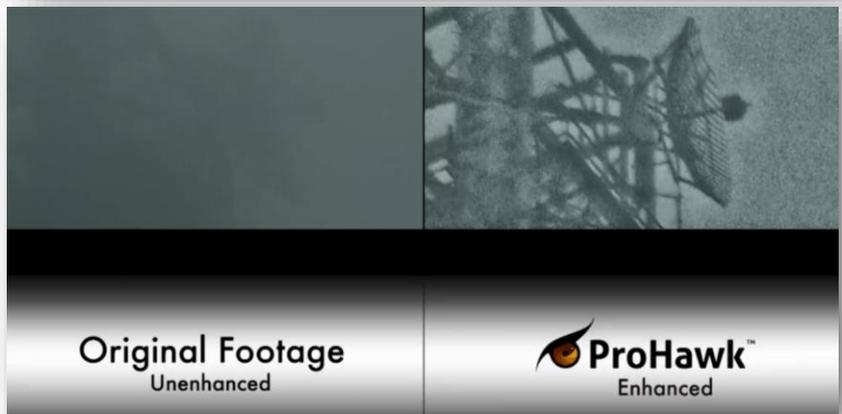
## Overview

The problem facing global autonomous vehicle market that leverage real time video is no camera is optimized to deliver high-quality actionable video in every environmental condition. The quality of the video captured from all camera systems is compromised by a variety of factors. Even the most advanced wide-dynamic range, high-definition, thermal or infrared cameras are restricted by optical physics and environmental challenges. The following conditions have the most significant effects on capturing high quality, actionable video:

**Adverse Lighting** caused by Night, Low Light, Backlight and extreme contrast like Sun Glare, Headlights and Infrared Imaging are challenging environments that distress the quality of video. These conditions significantly impact the image quality taken by all camera systems, rendering them ineffective and incapable to deliver meaningful and actionable video.



**Extreme Weather** conditions impact the visibility of all camera systems. The image quality from cameras operated outdoors can be severely compromised by the effects of severe rain, snow, dense fog, mist or haze removing any chance of capturing actionable data.



**Airborne Particles** in the environment can also negatively impact the quality of the imagery delivered by the camera. Representative challenges in this area include the impact of sandstorms, smoke, smog, dirt and dust, all of which degrade visibility and the camera's ability to capture quality video.



**There is a need in the autonomous vehicle market for Real Time Video Enhancement technology that can be tightly integrated.**

## Markets

Fully autonomous cars and trucks that drive us instead of us driving them will become a reality. These self-driving vehicles ultimately will integrate onto U.S. roadways by progressing through 6 levels of driver assistance technology advancements in the coming years. This includes everything from no automation, level 0, where a fully engaged driver is required always, to full autonomy, level 5, where an automated vehicle operates self-reliantly, without a human driver.

The demand for high quality, actionable, real-time video is rapidly increasing throughout Transportation specific applications for Autonomous Vehicles. The global autonomous vehicle market is expected to grow at a CAGR of 39.6% reaching \$126.8 Billion by 2027. Autonomous vehicles employ embedded software, sensors, and communications systems trending towards advanced Artificial Intelligence (AI) technology. True level 5 autonomous driving, full autonomy in **any and all conditions**, requires Real-Time Video Enhancement technology. Elon Musk, CEO of a leading autonomous vehicle company, Tesla, has said publicly, "Once you solve cameras for vision, autonomy is solved: if you don't solve vision, it's not solved...You can absolutely be superhuman with cameras."

## The Solution

ProHawk® provides Real-Time Video Enhancement technology that provides unparalleled clarity in compromised video due to lighting, weather, particles, and environmental conditions. ProHawk unlocks the highest quality enhancements with ultra-low 20 µSecs latency, enabling AI systems with vision systems to analyze & act on enhanced video in real-time. This enables high-speed mobile applications such as autonomous vehicles & aircraft, urban traffic monitoring, and smart cities.

The patented Detail Enhancement Filter is the core enhancement algorithm that achieves high image sensitivity by concurrently processes six distinct enhancements algorithms. These algorithms combined provide finer, sharper levels of detail and clarity, static visual noise reduction, improve color representation (natural to the human eye), remove objects obscuring visibility, defined and detailed edges, reduced blurriness, all without frame skipping & white clipping, eliminating the need for expensive and sophisticated optical systems.

## Value Proposition

ProHawk technology uniquely leads the market with critical patented algorithms:

**Comprehensive Low Latency Detailed Enhancement Filter Algorithm** – Optimized to minimize latency introduced while processing video enhancement. The market performance leader takes less than 20µs to enhance a HD-SDI 1080p60 video stream.

**Clear Tone Contrast Algorithm** – This algorithm provides low contrast image enhancement clarity because of extremely dark or bright frames and/or areas. Divides an image into blocks to leverage a tone brightness histogram to adjust brightness for every pixel.

**Contextual Color Correction Algorithm** – Very small/fast algorithm to identify color in over or under exposed areas delivering improved color representation natural to the human eye.

**Rapid Motion Detection Algorithm** – Removes unwanted objects obscuring visibility with noise reduction that eliminated frame skipping & white clipping. A simple 2 step bright and dark pixel processing code structure that detects rapid motion for every pixel simultaneously.

**Adaptive Detailed Enhancement Filter Algorithm** – Patent pending in-frame processing algorithm that does not require previous video frames or histogram. Designed for extreme moving source demands that are challenged with directional and/or target acquisition visibility difficulties. Delivers unparalleled video clarity with the lowest possible latency for autonomous vehicles, subsonic to hypersonic moving autonomous aircraft and missiles.