

## DELIVERING CRYSTAL CLEAR VISIBILITY FOR AUTOMOTIVE APPLICATIONS

NPS is a pioneer in next-generation radar operating systems, delivering crystal-clear visibility for life-saving applications. Its flagship product, Hyper-Definition Radar Operating System (HROS) is a next-generation radar solution that uses AI-powered, patented, advanced mathematical frameworks to deliver unparalleled clarity and responsiveness, at a price point that makes ground-breaking applications practical and accessible to everyone. HROS currently powers automotive and defense applications that rely on early detection and minimal false positives, to give people the freedom and confidence that they know what is around them in any situation. Founded in 2018, you can find NPS on the [Web](#), [X](#) and [LinkedIn](#).



## Hyper-Definition Radar Operating System

For ADAS Providers

With U.S. pedestrian fatalities doubling since 2010 and new automotive safety mandates on the horizon, automakers are racing to differentiate offerings and meet increasing consumer expectations for safety, convenience and performance at a reasonable cost. Faced with these mounting pressures, the demand for improved, more reliable Advanced Driver Assistance Systems (ADAS) has never been greater.

The 2029 NHTSA Automatic Emergency Braking (AEB) standards loom closer, requiring new passenger vehicles and light trucks to include AEB that can prevent collisions, even at speeds up to 62 mph – a threshold today's systems struggle to meet. The automotive industry faces a pivotal moment to enhance or replace existing technologies including cameras, LiDAR and traditional radar which struggle to meet performance demands, particularly in complex driving scenarios.

The NPS Hyper-Definition Radar Operating System (HROS) steps into this gap, offering the ability to prevent potential collisions with unmatched resolution and accuracy, even when driving at nighttime, in adverse weather conditions and at high speeds. HROS is a software-defined radar solution powered by safe and deterministic AI, that enables applications to "see" with a clarity that surpasses human vision and existing technologies. HROS offers optimal radar performance including early hazard detection and fewer false positives, ensuring that it outperforms current-generation radar processing technologies that suffer from low resolution and struggle with frequent detection delays.

HROS delivers significantly enhanced, reliable radar resolution with groundbreaking precision and responsiveness.

HROS leverages a ground-breaking mathematical framework, AI and patented algorithms, that dramatically change how sensor data is processed and understood to deliver unparalleled clarity and responsiveness. This mathematical framework, known as the Atomic Norm (AN), revolutionizes how raw sensor data is processed into relevant information. The AN software detects and recovers signals very close to the information-theoretic limits of what is mathematically possible, enabling drastically improved automotive applications.

Unlike traditional systems, which limit the scope of driver assistance applications, HROS unlocks optimal radar performance with unheard-of computational efficiency at a low cost. It achieves exceptional sub-beam resolution capabilities that improve decision-making for both human-operated and autonomous vehicles. The result is a radar platform that offers unparalleled clarity and responsiveness, enabling vehicles to navigate complex roadways with reliability and precision. HROS outperforms today's alternatives, setting a new standard for roadway safety with the potential to prevent car crashes before they occur and significantly reduce fatalities. HROS powers automotive applications that rely on early detection and minimal false positives, to give people confidence and certainty that they know what is around them in any situation.



## BENEFITS

- Hardware Agnostic, runs on commercially available low-power chips sets
- Dynamically Reconfigurable
- Achieves over 10x resolution boost
- With the state of the art 0.25° hyper-resolution radar technology, objects can be distinguished at twice the distance of existing 0.5° super-resolution technology
- Reduces false positives

## TECHNICAL INFORMATION

Examples of Requirements	Value
Range (Car) at 0° Azimuth	500 m
Range (Pedestrian) at 0° Azimuth	200 m
Range Accuracy/Resolution	0.15 m / 0.3 m
Angular Resolution	0.25° Azimuth 0.45° Elevation
Angular Accuracy	±0.125° Azimuth ±0.225° Elevation
FOV	120° x 30°
Interface	Ethernet
Dimensions	150 x 130 x 35 mm
Operational Temperature Range	-40° to +85° C*

\*Specification for next version, current version: -10° to +50° C