

PATHPARTNER

DRIVER MONITORING SOLUTION

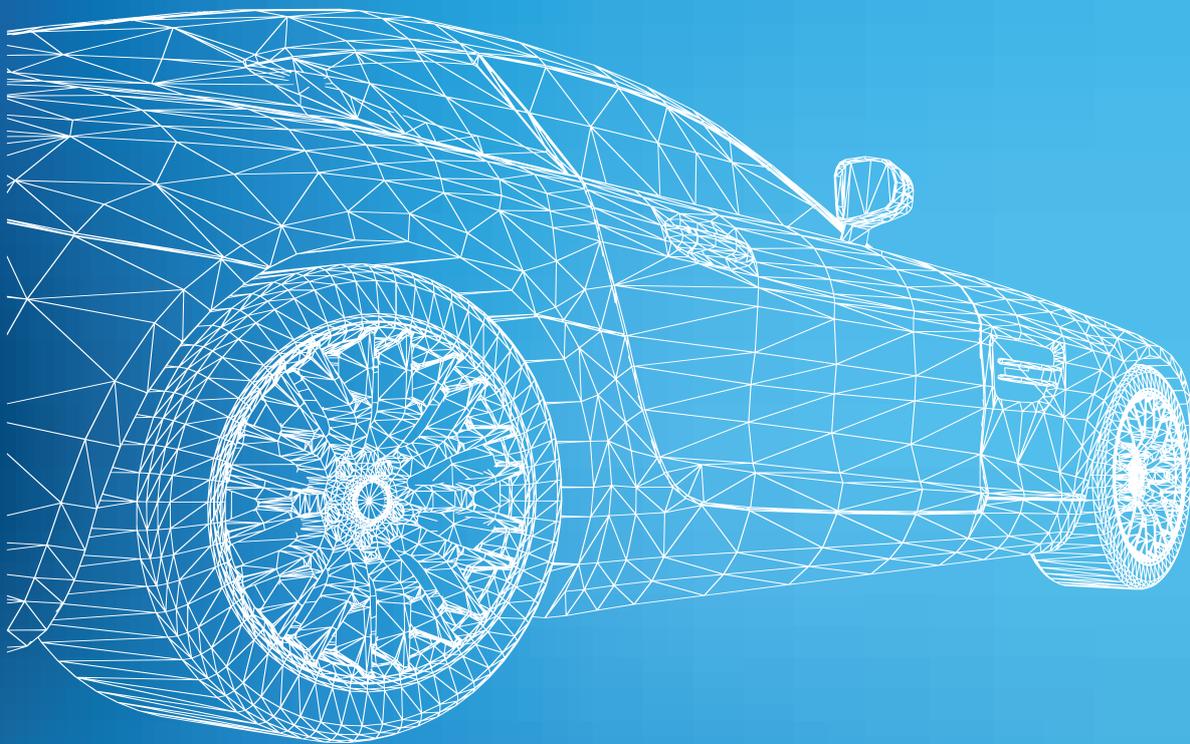
Complete hardware and software solution

Designed for configurability

Engineered for Embedded

Tested on RGB, IR & RGB+IR

Trained on over 100k subjects



Recognize and
authenticate driver



Detect driver
drowsiness



Detect driver
distraction



Introduction

Driver drowsiness, fatigue, and distraction at the wheel are often the cause of serious accidents worldwide. It is estimated that distracted driving is the number one cause of accidents in North America and one in five fatal accidents caused globally are due to driver fatigue. According to a study done on driver state monitoring systems, accidents can be reduced by 10-20% by adopting these systems. However, adoption of driver monitoring system (DMS) is slowed down by several barriers

COST

DMS relies on advanced technology like multiple camera sensors, complex algorithms, and powerful processors, making the system expensive

ACCURACY & RELIABILITY

DMS algorithms such as those for face detection, and eye gaze mapping are extremely complex and need to be trained on a diverse data set, for them to work accurately and reliably

EASE OF INTEGRATION

DMS systems at a very basic level consist of high speed processors, sensors, and multiple software components which need to be integrated into larger autonomous solution

Introducing PathPartner's Driver Monitoring System

PathPartner's single camera based In-cabin personalization solution

PathPartner's driver monitoring system, a licensable hardware plus software solution, provides reliable detection of driver drowsiness and in-attention, using a single low-power camera inside the vehicle. Driver monitoring system uses hybrid combination of advanced facial analysis algorithms & deep learning models to assess the driver's alertness and focus under challenging conditions. It provides information like face-pose, eye-gaze, alertness levels, eye height, age & gender etc., making it an interesting component for wide range of Advanced Driver Assistance System (ADAS) applications.

Applications

In-car driver safety systems

Fleet management solutions

Incabin personalization Solution

Features

Driver identification - Single image registration, Age group identification
Gender classification

Driver drowsiness detection - Close eye detector, Head nodding detector, Yawn detector

Drowsiness predictor - Blink assisted fatigue prediction, Yawn and blink count regressor
Slow blink classifier

Driver distraction alert - Looking away alert, Gaze assisted exceptions

Driver emotion estimation - Emotion classifier : Anger, Fear, Sadness,
Surprise Disgust & Happy. Works in diverse lighting conditions
and with various occlusions such as sun-glasses

Driver action classification - Action specific event trigger, Identify talking,
laughing, drinking, texting and eating

In-cabin occupancy - Efficient face count

Technology

One CMOS 2-megapixel camera – automotive grade

Low power near infra red illumination @ 850nm - 940nm

Designed for key platform architecture including ARM+GPU, ARM+FPGA,
DSP and vision accelerators

Currently optimized for Qualcomm Snapdragon

Output

Alerts for driver drowsiness and in-attention

APIs for getting module level information including

- > Head position and orientation
- > Eye gaze direction and eye lid opening
- > Mouth status tracking
- > Face recognition
- > In-cabin Occupation
- > Blink rate detection
- > Emotion detected

Why PathPartner Driver Monitoring System?

Reliable

Works under diverse operating conditions - illumination, dark glasses, camera position
Works in real-time with low latency and high accuracy

Affordable

No costly components. Utilizes standard, readily available automotive grade platforms and cameras.
Flexible business models

Ease of integration

Platform agnostic. Works on hybrid architectures including ARM, DSP, GPU, FPGA, & vision accelerators.
Reference hardware solution available
Easy to customize and integrate with well defined APIs

In addition to DMS software, PathPartner also provides a reference hardware solution based on Qualcomm's Snapdragon™ 820 processor



About PathPartner :

PathPartner is product R&D and engineering specialist. We help our clients develop, productize, and maintain advanced technology products. With our full stack engineering services, re-usable solution accelerators, and an unparalleled experience in transforming innovative ideas into full-fledged products, PathPartner provides its clients the advantage of top-of-the-line technologies, superior performance and faster time-to-market. With extensive expertise in embedded systems, computer vision, deep learning, multimedia and imaging technologies, PathPartner provides next-gen technology solutions to customers in automotive, internet of things, intelligent devices and digital media products domain.

PathPartner's catalog of products and services for automotive industry continues to expand. To know more details and collaborate on next-gen products, please visit www.pathpartnertech.com

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