

**Automotive Vision Industry Chain Report
2019-2020 (I) Monocular Vision**

May 2020

STUDY GOAL AND OBJECTIVES

This report provides the industry executives with strategically significant competitor information, analysis, insight and projection on the competitive pattern and key companies in the industry, crucial to the development and implementation of effective business, marketing and R&D programs.

REPORT OBJECTIVES

- ◆ To establish a comprehensive, factual, annually updated and cost-effective information base on market size, competition patterns, market segments, goals and strategies of the leading players in the market, reviews and forecasts.
- ◆ To assist potential market entrants in evaluating prospective acquisition and joint venture candidates.
- ◆ To complement the organizations' internal competitor information gathering efforts with strategic analysis, data interpretation and insight.
- ◆ To suggest for concerned investors in line with the current development of this industry as well as the development tendency.
- ◆ To help company to succeed in a competitive market, and

METHODOLOGY

Both primary and secondary research methodologies were used in preparing this study. Initially, a comprehensive and exhaustive search of the literature on this industry was conducted. These sources included related books and journals, trade literature, marketing literature, other product/promotional literature, annual reports, security analyst reports, and other publications.

Subsequently, telephone interviews or email correspondence was conducted with marketing executives etc. Other sources included related magazines, academics, and consulting companies.

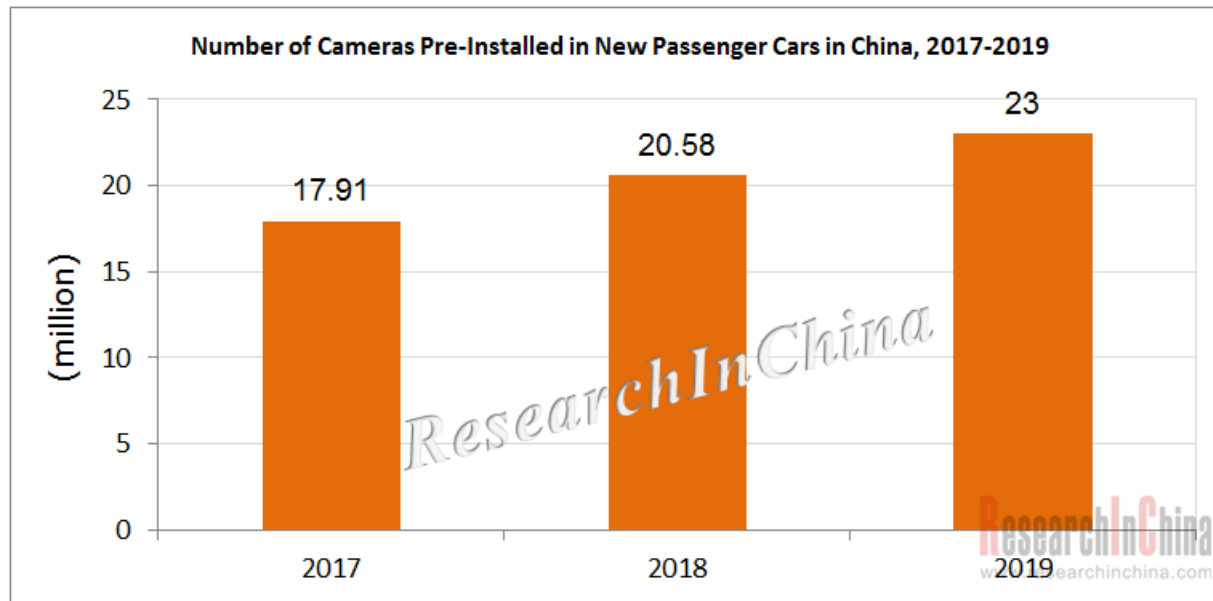
INFORMATION SOURCES

The primary information sources include Company Reports, and National Bureau of Statistics of China etc.

Abstract

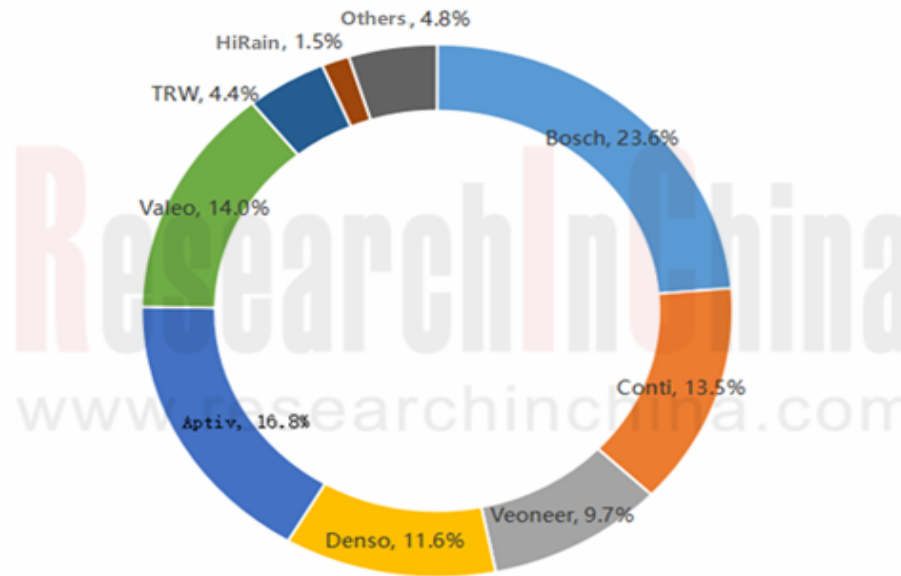
Automotive Vision Industry Chain Report 2019-2020 (I): The front-view monocular camera market soared 95.6% year-on-year in 2019

About 23 million cameras were pre-installed in new passenger cars in China in 2019, up 11.7% on an annualized basis, as is revealed by ResearchInChina.



Front-view monocular cameras and surround-view cameras grew by 95.6% and 23.9% year-on-year respectively, while both rear-view and side-view cameras dropped.

Market Share of Front-view Monocular Cameras Pre-Installed in New Passenger Cars in China, 2019



The Tier1 suppliers such as Bosch, Continental, Aptiv, Denso, Valeo, Veoneer, ZF, etc. occupy more than 90% share of the front-view monocular camera market, so that Chinese visual ADAS vendors that rarely ever break monopoly turn to focus on surround-view cameras, rear-view cameras, commercial vehicle vision ADAS and other markets.

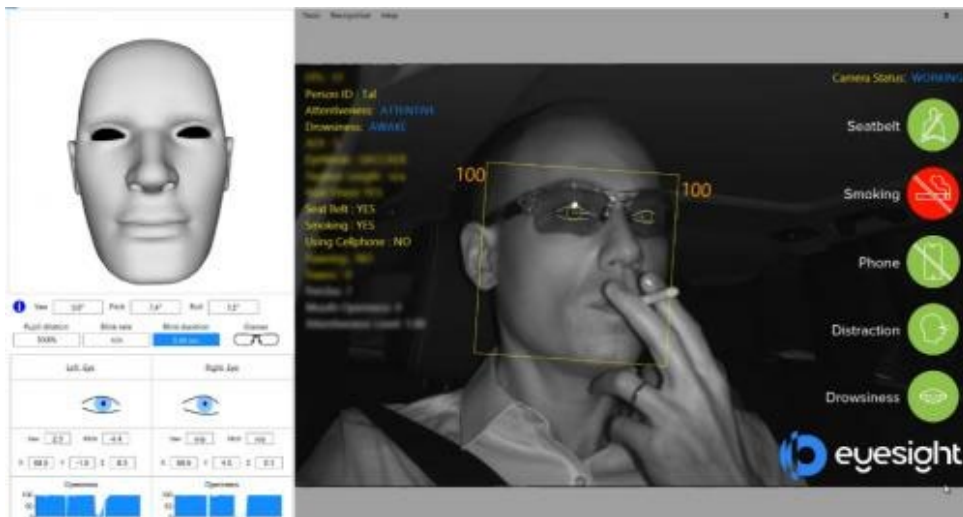
Cameras find wider application in automobile, in forms of DMS, CMS, binocular stereo, tri-focal, night vision, etc., broadening the market space of automotive vision observably. In March 2020, Waymo unveiled its fifth-generation autonomous driving system with the synergy of 29 cameras in all around the body to see a road sign 500 meters away through the overlapped fields of view.

Driver Monitoring System (DMS)

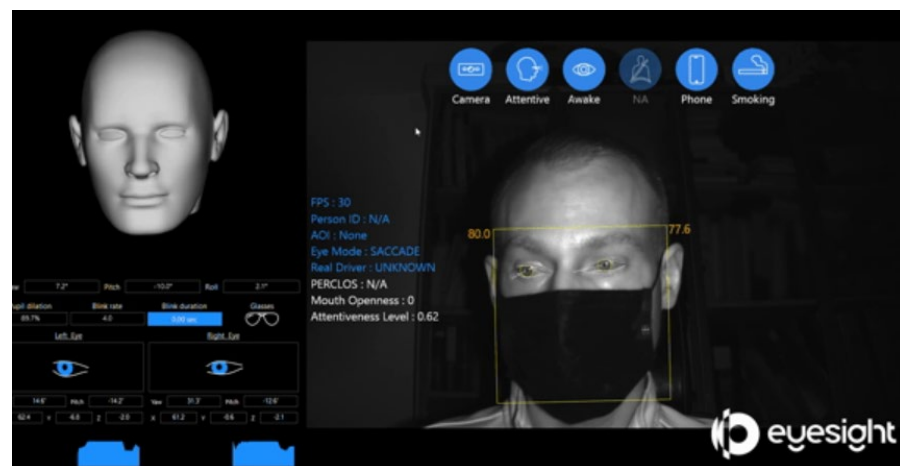
For safer driving on roads, European Commission approved EU rules requiring life-saving technologies in vehicles. The advanced systems that will have to be fitted in all new vehicles are: intelligent speed assistance; alcohol interlock installation facilitation; driver drowsiness and attention warning; advanced driver distraction warning; emergency stop signal; reversing detection; and event data recorder (“black box”). Most of these technologies and systems are due to become mandatory as from May 2022 for new models and as from May 2024 for existing models.

Over the past year, leading Tier1 suppliers and most visual ADAS startups have been developing DMS, especially the most active EyeSight, an Israeli start-up founded in 2005, provides driver monitoring, gesture recognition and user perception and analysis technologies.

On November 21, 2019, Eyesight announced new features for the company’s Driver Sense and Fleet Sense solutions to monitor the driver and detect driver distraction as a result of cell phone usage and smoking. The new features will be added to the company’s existing distraction and drowsiness detection capabilities to further mitigate driver distractions and prevent accidents.



In April 2020, Eyesight upgraded its platform for in-cabin sensing solutions to detect when drivers who wear face masks get distracted or feel fatigued behind the wheel. It has developed a set of AI algorithms that can keep track of drivers' behavior behind the wheel when wearing masks, protection goggles or sunglasses. The company's Driver Sense and Fleet Sense leverage IR sensors to analyze head position, eye openness, pupil dilation, blink rate, and gaze direction, in any lighting condition.



Camera Monitor System (CMS)

The spawned all-electric SUV Audi e-tron offers CMS as an option (EUR1,250). Lexus offers optional USD1,900 CMS. Honda e is the world's first model that provides CMS as a standard configuration. Tesla's first battery-electric pickup, Cybertruck, also uses CMS.



Models with CMS have much better night vision effects than the ones with traditional glass reversing mirrors..

Use in Cockpit Comfort System

Cameras are mainly used as the sensing components for ADAS. The popularity of telematics and smart cockpits help wider use of cameras in cockpit comfort systems.

For instance, Faurecia integrates smart devices such as cameras with recognition capabilities, Microsoft Connected Vehicle Platform (MCVP) and cockpit domain controllers as well as the hardware like traditional speakers, smart headrests and exciters embedded on the surface of vehicles to offer the user with personalized audio options and improve the sound conditions of the entire cockpit.



Automotive Vision Industry Chain Report 2019-2020 (I) -- Monocular Vision highlights:

- Automotive vision industry chain at a glance
- Chinese passenger car camera market
- Foreign automotive vision companies
- Chinese automotive monocular vision solution providers

Automotive Vision Industry Chain Report 2019-2020 (II) -- Binocular and Surround-view Cameras highlights:

- Development trend of automotive vision industry
- Binocular vision companies
- Surround-view technologies and companies
- Key automotive camera parts suppliers

1. Overview of Automotive Vision Industry Chain

- 1.1 Introduction to Automotive ADAS
- 1.2 Functions of Automotive ADAS
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