

Computer Vision Technologies and Markets 2020 Report

Part of the AI & Intelligent Automation Service Area Package

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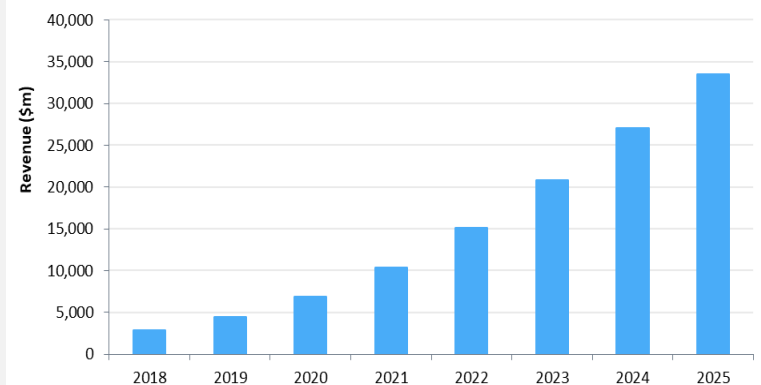
Use Cases, Technologies, and Applications within 25 Industries for Computer Vision: Global Market Analysis and Forecasts

Computer vision (CV) has become commercialized in the past few years and is being deployed in a wide range of applications. The proofs-of-concepts that started a few years ago are now going into production. They are creating a new set of problems that are providing opportunities for yet another group of startups. The rapid growth of technology, accurate results, falling price of hardware, and ease of connectivity are some of the factors enabling the rapid global adoption of CV.

Omdia considers CV to be a horizontal market, as the applications are spread across many different use cases. This report focuses on 69 use cases in 25 industries that are tracked by Omdia. CV has enabled many capabilities in products that were part of science fiction until recently. The global CV market has gained significant momentum in the past few years and does not show any sign of slowing down. As of 2020, the market has started figuring out how to use CV technology for commercial benefit. Global CV market revenue is expected to grow across many use cases in different industries, increasing from \$2.9bn in 2018 to \$33.5bn by 2025.

This Omdia report analyzes the market trends and technology issues surrounding CV. The study examines the industries and use cases and provides profiles of key industry players. Global market forecasts, segmented by region, industry, and use case, extend through 2025. The report also provides a description of various technical hurdles and the different business models used within the CV industry.

Total computer vision software revenue, world markets: 2018-2025



Source: Omdia

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Report Coverage

| KEY ISSUES ADDRESSED | KEY MARKET FORECASTS | COVERAGE | APPLICABLE TO |
|---|--|--|--|
| <ul style="list-style-type: none"> • What is computer vision (CV)? • Why is it so hard to get a computer to recognize a picture just like humans? • What are the current applications for CV systems? • What are the key market drivers and challenges for CV systems? • What are the most popular use cases for CV? • Which CV industry will exhibit the fastest growth? • What business models are being used by CV companies? • How quickly will the global CV market grow through 2025? • What changes have occurred in the CV market in the last couple of years? | <ul style="list-style-type: none"> • Total computer vision software revenue by region, world markets: 2018-2025 • Total computer vision software revenue, world markets: 2018-2025 • Total computer vision software revenue by technology, world markets: 2018-2025 • Total computer vision software revenue by industry, world markets: 2019 • Total computer vision software revenue by industry, world markets: 2025 • Computer vision software revenue share, top eight use cases, world markets: 2019 • Computer vision software revenue share, top eight use cases, world markets: 2025 | <p>Technologies</p> <ul style="list-style-type: none"> • Computer vision • Machine vision • Deep learning • Pattern recognition • Object recognition • Object tracking • Facial recognition • Optical character recognition • Image processing • 3D image extraction • Image stitching • Morphing | <p>Regions</p> <ul style="list-style-type: none"> • North America • Europe • Asia Pacific • Latin America • Middle East & Africa |
| | | | <ul style="list-style-type: none"> • Mobile device manufacturers • Consumer electronics device manufacturers • Industrial automation companies • Medical device companies • Automotive companies • Semiconductor and component vendors • Software developers and integrators • Government agencies • Investor community |

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Omdia is a global technology research powerhouse, established following the merger of the research division of Informa Tech (Ovum, Heavy Reading, and Tractica) and the acquired Omdia technology research portfolio.* We combine the expertise of more than 400 analysts across the entire technology spectrum, covering 150 markets. We publish over 3,000 research reports annually, reaching more than 14,000 subscribers, and cover thousands of technology, media, and telecommunications companies. Our exhaustive intelligence and deep technology expertise enable us to uncover actionable insights that help our customers connect the dots in today's constantly evolving technology environment and empower them to improve their businesses—today and tomorrow.

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Executive summary

Introduction
Changes from the last report
Key findings
Business models
Market forecasts

Market Issues

Market definition and overview

- Business models
- Software as a service
- Technology licensing and royalties
- One-time payments
- Product as a service
- Subscriptions
- Payments for compute resources
- Pay-as-you-go and services

Market drivers

- Need for safety and security
- Need to optimize law enforcement
- Need for personal security
- Need for automation
- Businesses need to reduce costs
- Sci-fi-like applications
- Cooler consumer and gaming applications
- Falling prices of cameras and sensors
- Increased safety needs in automotive

- Government regulations
- Availability of venture capital and competition
- Availability of powerful, low cost hardware, and open-source libraries
- Increased accuracy of computer vision systems
- Ease of connectivity

Market barrier

- Time to revenue and ramp-up
- Accuracy and reliability
- Increase in methods to fool image recognition
- Pricing and business models
- Development costs
- Power consumption

Regulatory issues

- Automotive regulations
- Drone regulations
- Export regulations
- Privacy issues
- Liability and insurance

Key markets and use cases

Widely used use cases for computer vision

- Video surveillance
- Machine/vehicular object detection, identification, and avoidance
- Localization and mapping

- Satellite imagery for geo-analytics
- Medical image analysis
- Human emotion analysis
- Image analysis for journalism
- Augmented reality/virtual reality development
- Ad insertions into images and videos
- Face recognition
- Food safety

New use cases for computer vision
Selected popular use cases and applications

- Automotive (in-cockpit monitoring and driving automation)
- Machine vision and robotics
- Drones
- Surveillance and security
- Post-event analysis
- Medical imaging
- Sports and entertainment
- Consumer applications
- Agriculture
- Retail

Regional differences

Technology Issues

Computer vision challenges

- Computer vision pipeline
- Image processing
- Image pre-processing
- Classic computer vision techniques
- Neural networks and AI
- Post-processing

Machine vision

Intelligence location: Edge, on-premise, and cloud

- Edge systems
- On-premise systems
- Cloud-based systems

Frequently used computer vision algorithms

- Facial recognition
- Optical character recognition
- Object detection and classification
- Sentiment segmentation
- Person tracking
- Video analytics
- 3D object recognition

Computer vision market ecosystem

Computer vision software

- Open-source computer vision libraries and frameworks

AI and deep learning

- Convolutional neural networks
- Computer vision training
- Transfer learning and inference

Hardware platforms for computer vision

- Central processing units/digital signal processors
- Graphical processing units
- Field-programmable gate arrays
- Application-specific integrated circuits

Limitations and challenges of computer vision technology

- Conditions beyond human control
- Use of supplemental sensors
- Lack of testing
- Reliability
- Training datasets
- Real-time computation
- Power consumption
- Technology expertise in deep learning
- Availability of middleware and IP for rapid application development

Key conferences in computer vision

Industry organizations

- Embedded Vision Alliance
 - European Machine Vision Alliance
 - Automated Imaging Association
- Universities and research institutions


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Key Industry Players

Amazon
Autoliv
Avigilon (acquired by Motorola Solutions)
Ambarella
Crossmatch (acquired by HID GLOBAL)
Cognex
Cruise.ai (acquired by General Motors)
DJI
Drive.ai (acquired by Apple)
Facebook
Google (Alphabet)
Hikvision
Intel
Megvii (Face ++)
NVIDIA
Parrot
Qualcomm
Tesla
UBTECH Robotics
Velodyne Lidar
Videantis
Xilinx
Other industry players

Computer Vision Industries

Overview
Advertising
Aerospace
Agriculture
Automotive
Business services
Construction
Consumer
Defense
Energy
Fashion
Financial services
Food & beverage
Gaming
Healthcare
IT
Manufacturing
Media & entertainment
Oil, gas, and mining
Public sector
Real estate
Retail
Scientific research
Sports
Telecommunication
Transportation

Market Forecasts

Forecast methodology and assumptions
Computer vision software revenue
Classic vision vs. deep learning Industries
Top use cases
Conclusions

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