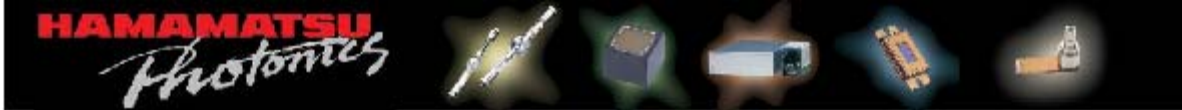


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## **Multifaceted Innovation Drives Machine Vision Industry**

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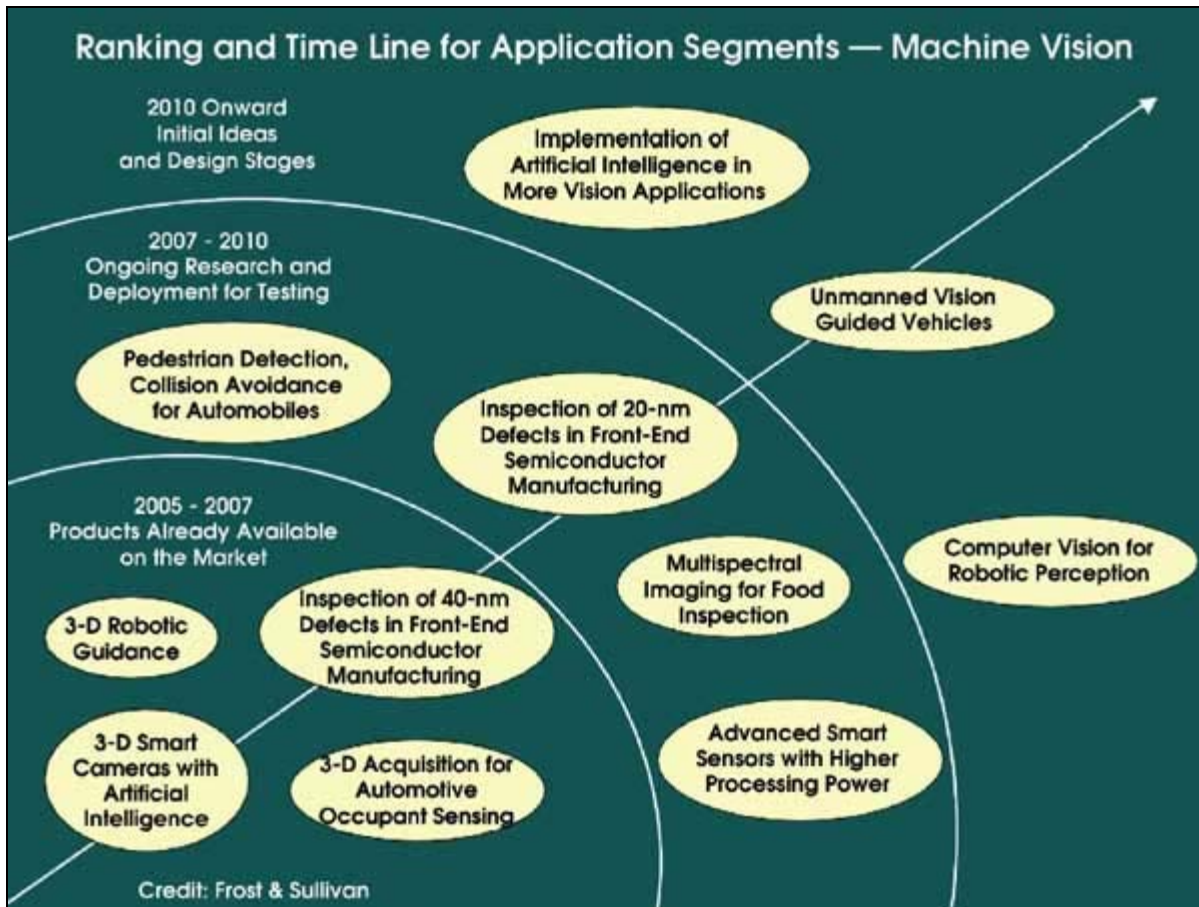
Hardware that is used to integrate machine vision systems is becoming more compact and sophisticated. Designers are leveraging these improvements to produce easy-to-use vision systems for a variety of applications. Market analyst Frost & Sullivan of London has released a study titled "Advances in Machine Vision Systems," which discusses new products and technologies in the industry.

The company's analysts reviewed patents to determine key technological players in the field. They conducted interviews and research to gain insight into trends, drivers and challenges.

Architectures, cameras, robotics, infrared imaging, artificial intelligence and advanced image processing were studied. Many of the applications analyzed are in the manufacturing sector; among them, packaging inspection, robotic guidance and quality control.



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The report suggests that advances in machine vision components and hardware are driving the rapid growth in the market. The lower cost of high-performance processors is a key factor, and improvements in sensors, cameras, lasers, embedded systems and illumination methods have created innovative applications.

Machine vision systems, which are meeting increasingly high-end demands, are expanding applications and raising expectations. Designers are building systems around applications, spurring innovative technology. In many cases, vision systems must be scaled across products and production lines. They are being used for in-line process control and monitoring because of their high speed and accuracy. Smart sensors have reduced the complexity of the systems, making them more flexible and user-friendly.

Many applications have progressed from 2-D inspection to 3-D image acquisition systems, which have gained prominence because of the enhanced processing power available. The technology has created opportunities in the areas of surface inspection and robotic guidance.

Some manufacturers are providing the 3-D acquisition functionality on a single chip. Canesta Inc. of Sunnyvale, Calif., supplies 3-D vision systems with embedded chips for automotive inspection applications. That company and others are building 3-D vision chips for other automotive applications, such as controlled air-bag release. The thermal imaging technique is being applied to machine vision inspection and monitoring as well.

The report also describes a multispectral imaging system being developed by the US Department of Agriculture and the University of Michigan in Ann Arbor. In the food inspection industry, it has the potential to determine the internal characteristics of fruit.

Vision system research is under way to further miniaturize architectures, to improve speed and accuracy, and to develop a system that detects underlying characteristics of objects. The report contends that more research will enable vision systems to perceive, rather than merely inspect. With artificial intelligence techniques applied to the systems, robots, for example, will be able to see, think and respond to objects and events in an almost "humanlike" manner. The immediate advantage of artificial intelligence in machine vision, however, is the reduction in a system's commissioning time and operator-friendly features.

More information on the study is at [www.frost.com](http://www.frost.com).

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