

## Feature 2 From the Front Line

### The Birth of Smile Scan

— The Front Line Leads the Way —

In February 2009, Omron released a new sensor technology that immediately generated media buzz for its innovativeness and surprising applicability. Smile Scan, which measures the degree of a person's smile, was an instant hit. We now report back from the front lines, where the concept of Smile Scan developed.

\*Interviewed by the annual report editor.

# OMRON MAKES IT POSSIBLE



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— Why did you decide to focus on the face?

**Mr. Ogawa** Omron is an industry leader in sensor technology. Using sensors to “visualize” objects and images is a fundamental competency of Omron, and applying sensors to visualize society is a specific focus of the Social Systems Business (SSB). What does that mean exactly? Omron has focused its business development on places where people gather, such as train stations, roads, and commercial facilities, and the social climate has inevitably increased need for safety and security in these locations. The application domain of sensing and control technology is also broadening and is now used for such diverse purposes as creating comfortable places and promoting communication among people to new applications in environmental fields.

When we first considered how sensors could be used on people—the core component of society—we realized that face recognition presented an enormous range of unique applications that could be pursued.

### A Product of Our Enthusiasm

— Where did the idea to develop Smile Scan come from?

**Mr. Sogo** Fundamentally, sensors and controllers are used to enhance safety and security, so it was by no means obvious how a sensor that measures people’s smiles could be turned into a marketable product. Although we were able to use it to demonstrate the unique capabilities of our sensors, to be honest, I never thought it could be commercialized. Then, one of our employees who is closely in touch with customer needs included it in a product catalogue and told us, “We have to make this into a product.” Taking his

advice, we put it onto a list of product proposals for our customers and received positive feedback from train station workers, nurses, and many others saying they wanted to give it a try.

### The World’s Finest Face Recognition Technology

— How was Smile Scan developed, and how does it work?

**Mr. Ohashi** As we were researching and developing the face recognition technology, we gradually started noticing the unique changes that occur when a person smiles, such as the lowering of the corners of the eyes, the rising corners of the mouth, and increasing wrinkles in certain places. Smile Scan measures and quantifies those changes and gauges a smile on a range from 0 to 100.

— It detects wrinkles too?

**Mr. Ohashi** Yes, it does. However, increasing the number of points where we gather information increases the amount of data to be processed and ultimately slows the processing speed. The real challenge was paring down the data to only that which is necessary to produce an accurate reading. To enable instantaneous data processing, it was critical to create the leanest possible algorithm for the application environment and objective and then to sense with pinpoint accuracy only the absolutely essential data.

— Is this an example of an Omron strength that is unmatched by other companies?



**Toshinobu Ogawa**  
Social Systems Solutions Business Company  
Social Sensor Solutions Division  
Strategy & Planning Department  
Manager

I would like to see Smile Scan used as a component of an innovative solutions business.



**Koji Sogo**  
Social Systems Solutions Business Company  
Social Sensor Solutions Division  
Solution Engineering Department  
General Manager

There are innumerable applications yet to be discovered. As we uncover them, I am looking forward to developing the second- and third-generation Smile Scans.



**Makoto Ohashi**  
Social Systems Solutions Business Company  
Social Sensing Products Department  
Assistant Manager

We will partner with various companies to create fascinating uses for the technology.

**Mr. Sogo** This technology is something we can be proud of. The high-speed and consistently accurate face recognition we have achieved is the result of examining a massive amount of facial data and developing very specific high-performance technology. The face recognition algorithm was developed based on an image database of more than five million faces collected over more than a decade.

**More Accurate Than Subjective Judgment**

— Are the devices more accurate than the human eye?

**Mr. Ohashi** The same standards are used to measure every smile, which enables a more objective and quantitative evaluation than the human eye is usually capable of, particularly for complicated smiles. For example, in terms of the capability to determine gender and age, people often have some difficulty discerning if a person is in their 20s or 30s. However, a device programmed to identify a person’s sex and age estimates whether the subject is male or female and young or old without subjective parameters. The

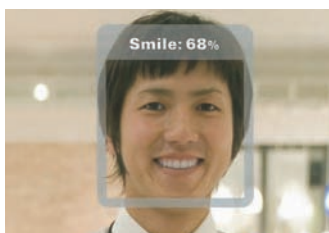
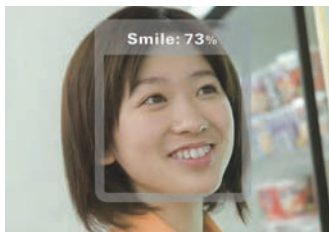
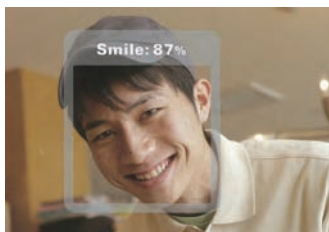
devices can process a higher volume of data faster and produce assessments more accurately than a person can.

**Half of Annual Sales Target Achieved in the First Quarter**

— What has been the reaction to Smile Scan?

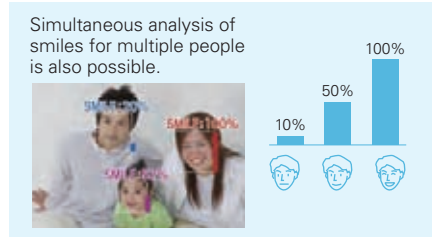
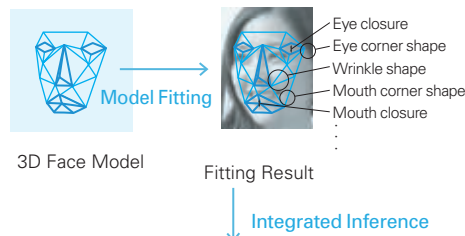
**Mr. Ogawa** The first use of Smile Scan was by medical staffs in a hospital that wanted to harness the effect the smiling faces of doctors and nurses to increase patient satisfaction. Recently, we are receiving increasing interest from the restaurant industry. In terms of volume, we think sales are off to a good start. Our target was to sell 100 units in this first year, and we have already sold 50 units in the first quarter (of fiscal 2009). This is a product that will find an increasing number of applications, and we see it as an elemental entry product for developing our solutions business. We are considering developing a higher-grade model in response to media attention as well as to the spontaneous emergence of potential applications.

**Smile Scan**



Smile Scan utilizes a specially programmed sensor to capture an image of a person’s face and automatically gauges the degree of their smile from zero to 100%.

Real-time Smile Measurement Technology



Small analog camera



Sensor unit



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### Important to Create Ongoing Relationships to Identify and Resolve New Issues

— The Electronic Components Business (ECB) is also developing products from its OKAO Vision face recognition technology. What are your thoughts on that?

**Mr. Ohashi** ECB is integrating its OKAO vision face recognition technology with precision processing technology into components for camera-equipped mobile phones and other devices. The objectives are slightly different, as ECB is developing products for consumer electronics, such as household electronics, while SSB is advancing its face recognition technology for its social systems solutions business. Maintaining ongoing and constructive relationships with client companies involved with social systems will be important so we can work together to develop solutions to new issues that arise during the operation and maintenance of the products.

It will be necessary to expand the sensor capabilities to products that go beyond simply “seeing” to “observing” and “diagnosing.” Our first step in that direction was the release in summer 2008 of “segment sensor” products capable of estimating a person’s sex and age based on facial features. Segment sensors analyze a face based on feature correlations. For example, a child’s face differs from an adult’s face because the eyes are bigger and higher, the space between the eyes and eyebrows is wider, and the nose and mouth are smaller.

Segment sensors can be placed at entryways or aisles in train stations, department stores, or supermarkets to identify the movement activities of men and women and people of different ages, or to assess whether product lineups match the target customer. This data could contribute enormously to a store’s marketing effectiveness and support continuous improvement in store management. Segment sensors are uniquely effective solution devices.

### Seeing the Unseeable

— Is Omron’s high-level consulting know-how

also needed for effective solutions?

**Mr. Ogawa** The technology we have developed for our railway infrastructure and traffic control systems is very highly specialized, and I believe it provides a platform for us to be the industry leader in solutions development for public facilities. We have accumulated extensive know-how from our experience in developing, installing, and operating loyalty-based discount systems for commercial facilities during which we had to examine such issues as how increasing loyalty points affects consumer patterns and sales. Our face recognition technology is a leading-edge technology that basically makes it possible to “see” data that was previously invisible. Determining how that data can be used and even what would be useful once it becomes visible are emerging issues. Working closely with the device users, that is, our customers, will be essential, and we will bring the full depth of our experience to play as we seek to realize the vast potential benefits of the new technology.

— Will Smile Scan also be used to develop Omron’s solutions business?

**Mr. Sogo** In the future, store operators could utilize smile measurement data as an indicator of cheerfulness within the store or other elements that are now considered intangible yet could become functional data for maintaining and improving business. It’s even said that crime occurs less often in cheerful and pleasant environments, so this data could also contribute to safety and security.

As Mr. Ogawa said, Smile Scan is fundamentally an elemental entry product to initiate and invite new business. I would like to see Smile Scan used as a component of a proposal-based business that leads to real business solutions created by listening to the opinions and needs of users, primarily at commercial facilities, to maximize the sensor ability to gauge a person’s attributes and monitor the activities and flow of visitors.