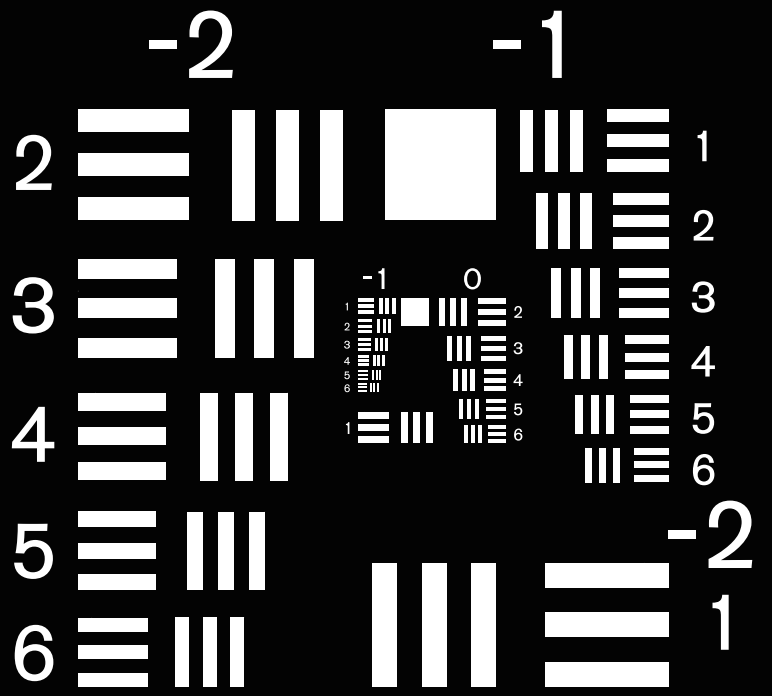
THE
TECHNOLOGY
REPORT_



Issue: 00

Resolution

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Technology serves as a means for humans to make something a reality.

The concept of new technology is captivating. Currently, concepts like NFT (Non-Fungible Token) are at the center of excitement. Many people become overly immersed in NFT-centric manufacturing, forgetting the main challenges of their business.

Indeed, technology brings breakthroughs. But, if you're a little careless, you can be swung around by high-speed technology, resulting in starting something that is means-driven. Such is the strong force of new technology.

To not be swept away by this force, it is necessary to read the direction of the wind of technology. This is not about having a sense of understanding by using complicated jargon, but essentially understanding why the wind blows from that direction and creating an effective vision for future business.

This magazine has been created mainly by those responsible for technical direction.

It is a task that involves communicating with both the "planners", for example business owners, and the "doers", for example programmers, as well as translating and supervising technology.

We believed that gathering a group of technical directors and researchers proficient in both thinking and hands-on work to verbalize and systematize their sense of technology would lead to create a compass for good manufacturing without being swayed by the means of "planners". This is why this project was launched.

It would be gratifying if "THE TECHNOLOGY REPORT" could serve as a catalyst for readers to read the flow of technology and create a vision to help understand the direction of technology, how to use it, and where to lead the future of business.

Publisher: Qanta Shimizu

Special Feature: Resolution

Resolution as a “Measuring Tool”

Certain technologies become a measurement. They show us how far we have reached into the future, how distant the past is, and whether we are accelerating or decelerating. From steam engines to autonomous driving, human technology has continued to evolve. However, that progress has not been linear. There have been at least three industrial revolutions, and each time, evolution has entered an accelerated phase. So, are we now in a gentle growth phase, or are we in the midst of exponential evolution? There’s no clear answer. But we can search for a measuring tool. A signpost for exploring the current location of technology. One such measuring tool is “resolution”.

Resolution is continually increasing in various fields. Not just images and videos, but also sound, and even space itself, can now be recorded and played back with an intricacy incomparable to the past.

The display resolution of the iPhone 3GS, released 12 years ago, was 163 ppi (Pixels per Inch). In contrast, the display resolution of the iPhone 13, released in September 2021, is 457 ppi. It has increased by around 2.8 times in these 12 years. The mesh that was visible between pixels if you looked closely in the past is now invisible, no matter how hard you look on the latest iPhone.

Converting information into digital data means capturing the world through a mesh. The mesh structure can reproduce a scene by dividing a landscape into a grid, recording each square’s color, and exporting each square in sequence. Of course, what can be reproduced is the world seen through the mesh. However, when the mesh itself reaches a level that is “too fine to perceive”, the digital data and the real scenery become indistinguishable.

So, let’s take a peek through the mesh of the “measuring tool” called resolution. What kind of scenery will come into view?

“We want to see more”. This desire has driven the evolution of technology. We want to see more details, more things, bigger things, and even the invisible. The recent meteoric rise in “resolution” across various domains is the realization of such wishes. We are now living in a world where resolution continues to improve.

So, what exactly have we become able to see?

Look Far, Look More, Look Big

"Beyond human eyesight" is the phrase once set as a development goal by SONY for its image sensors. This goal, we can say, has not only transcended SONY's business domain but has been fully achieved in the entire field of image sensors. Image sensors, the retinal part of a camera, have evolved in ways that we can perceive in our daily lives.

For example, you can now shoot commercial films with your regular iPhone. In the 2016 film "Shin Godzilla", consumer devices like iPhones and GoPros were used.
Or in the aspect of "technology to look far", resolution has advanced. With the world's largest image sensor, you can see a golf ball 24 kilometers away. Developed by the research team at SLAC National Accelerator Laboratory, operated by Stanford University, this image sensor has a resolution of 3.2 billion pixels and can capture an area equivalent to 40 full moons in a single shot.

Thanks to resolution, new encounters have emerged. We can now view many works of art on the web. As a result of the extreme increase in accessible image resolution, this experience goes beyond mere "searching and viewing" and is transforming into something that might be called an "encounter with a work of art".

This has been made possible by Art Camera. The Google Cultural Institute uses a robot called Art Camera to photograph paintings around the world at a resolution of one billion pixels (gigapixels) and post them on the web. You can now view Van Gogh's masterpieces displayed in the New York Museum of Modern Art and even feel his brushwork while in Japan. Or you can gaze at Klimt's greatest work, "The Kiss", exhibited in Vienna's Belvedere Palace, so closely that you can clearly see the cracks in the dry pigments.

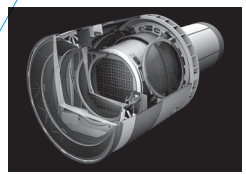
Art Camera works by "stitching together a large number of photos". By moving a high-resolution digital camera with a robot, they take hundreds to thousands of close-up photos of the subject. By connecting these photos, a gigapixel image is obtained. It's not about capturing everything in an instant but rather connecting multiple captured images, making it unsuitable for moving subjects but an effective method for static subjects like paintings, sculptures, and still life objects.

If you use "stitching together" skillfully, you can photograph even very large things in high resolution. For example, Earth. Google Earth photographs the "Earth" using the same concept as Art Camera. Various satellites orbiting Earth take pictures of the surface, and they are stitched together to create one giant image.

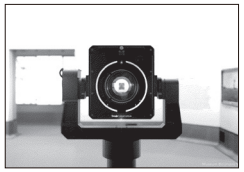
Image sensor resolution has surpassed human eyesight. In the sense that it can record things further away, larger, and in more detail. Yet our desire is not exhausted. We not only want to see a flat surface but desire to see through space itself.

A technology that converts the image through a lens into digital information using photodiodes that convert light intensity into electrical signals. The number of diodes on the sensor determines the "pixel count", and the "resolution" is determined by how many pixels are packed into an area.

Atsuki Sato who was the editor and VFX supervisor for "Shin Godzilla" said, "We talked about using the iPhone during test shooting. And when we tried it, we were astonished at the preview. It's great." "A large camera can't smoothly get into narrow interiors or get the desired angles. But with an iPhone, it slips right in." *1



The LSST camera's image sensor is realized by combining multiple CCD sensors with high precision. Compared to the ones installed in regular digital cameras, which are about 3.5 centimeters, its size exceeds 60 centimeters. *2



Previously, ultra-high-resolution shooting of stored items could only be performed by a few experts in the world using expensive and complex equipment. But with the development of Art Camera by the Google Cultural Institute, this process has been dramatically simplified, and digital archiving is progressing at an unprecedented speed. *3

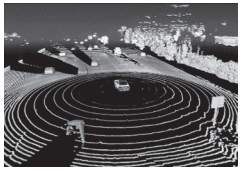
For details on the mechanism of Google Earth, refer to the explanatory video created by a Google employee YouTuber. In recent years, photos taken from aircraft have been used to employ photogrammetry technology, automatically generating 3D data of buildings and terrain. *4

Looking at Space Itself

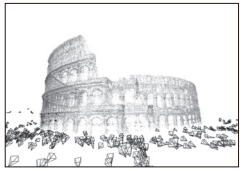
What's in the foreground and what's in the background? How expansive is it?
If we can gather such information, what we can deduce from an image will surely increase even more. Furthermore, if we could enter and walk around in the recorded space, we might say that we have obtained a new gateway to reality. To record the depth of space, we need "words that describe depth". This is referred to as "depth information."
When taking a photo, in addition to the colors and brightness of the scenery, depth information, that is, how far back each part is, is written into the pixels. For example, setting the foremost position as zero, and increasing the value as it goes farther (the depth becomes greater). By doing this, you can convey what is in the foreground and what is in the background for captured objects.

LiDAR serves as a kind of "eye to see depth", and is a technology used in self-driving cars. By understanding what is in the background, you can make situational judgments such as "if the object is coming closer or moving away". By equipping self-driving cars with LiDAR and 360-degree cameras, it becomes possible to gather information about the surroundings or detect dangers just like, or even more effectively than, humans. DJI's Zenmuse L1, released in 2021, can record 240,000 depth data points per second, thanks to the addition of a 2-megapixel RGB camera and a LiDAR sensor.

There are other approaches like this to "capture space itself". Of course, once it's captured, you can walk around inside the captured space. As image



A technology that measures the distance (depth) to an object by illuminating it with laser light and observing the scattering of reflected light. It was originally used for measuring terrain and buildings, but in recent years, sensors have become smaller and are now installed in higher-end models of iPhones and iPads. *5



A technology that builds 3D diagrams from photos/videos taken from various angles. It has been widely used in many fields since the 19th century. The 2009 project "Building Rome in a Day" by the University of Washington became a significant topic, reconstructing Rome's cityscape in 3D only from "tourist-taken photos" uploaded to the internet. This attempt became a catalyst for the reevaluation of photogrammetry as a technology to restore 3D shapes from photographs. *6

A type of free-viewpoint video that can generate the 3D data of the subject from video taken from various angles surrounding it. The technology can reproduce various viewpoints including those where there originally were no cameras. This can also be thought of as an application of photogrammetry technology to video.

sensor resolutions have advanced, cameras have not only accomplished the function of "cutting out a specific time and place" but have made it possible to "capture the whole".

One such method is photogrammetry technology. It constructs space by understanding the "parallax" from the difference between the shooting position data and the captured images. Volumetric capture technology also converts existing people and places into three-dimensional data and reproduces them in high quality. When viewing the captured space, you can freely move the viewpoint.
These new methods enable not just the recording of space but also allow people to freely walk around and manipulate time within the three-dimensional space.

In just a decade or so from the time when we could visually see the mesh between pixels, resolution has dramatically evolved. We can now feel the texture of a painting in a distant place or capture space itself. Where will this "information beyond human eyes" lead us? In the next chapter, we will explore this, introducing cases where high-resolution information is utilized.

*1
"「シン・ゴジラ」舞台裏を支えたのは iPhone と iPad ？ 監督が明かす", BuzzFeed Japan, accessed 29 November, 2021
https://www.buzzfeed.com/jp/yuikashima/shi-n-go-ji-ra-ha-iphone-de-satsuei-sa-re-ta-higuchi-kantoku

*2
"Image by SLAC / Rubin Observatory", accessed 29 November, 2021
https://gallery.lsst.org/bp/#/folder/2334405/51675569

*3
"An eye for detail: Zoom through 1,000 artworks thanks to the new Art Camera from the Google Cultural Institute", The Keywords Google, accessed 29 November, 2021
https://blog.google/outreach-initiatives/arts-culture/art-camera-cultural-institute/

*4
"Google Earth's Incredible 3D Imagery, Explained", Nat and Friends, accessed 29 November, 2021
https://www.youtube.com/watch?v=suo_aUTUpps

*5
"Alpha Prime", Velodyne Lidar, accessed 29 November, 2021
https://velodynelidar.com/products/alpha-prime/

*6
"Building Rome in a Day", University of Washington, accessed 29 November, 2021
https://grail.cs.washington.edu/rome/

You can refer to this collection of references, including the sources introduced in "Eyes That See Infinitely", as well as related examples that could not be fully covered in the print edition, via the 2D code on the right.

Eyes That See the Invisible

In our quest for a vision that can reach everywhere, we have acquired high-resolution eyes in various fields. Yet our desire is insatiable. What people seek next is the ability to "see the invisible". In this chapter, we will introduce the latest examples of efforts being made to make visible what we previously could not see, based on an amount of information that goes beyond human eyes.

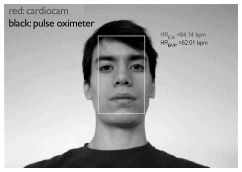
Seeing the Heartbeat and the Trembling

Imagine knowing how excited someone is just by looking at them. If such a thing were possible, it might unlock breakthroughs in unrequited love or even challenging negotiations. A technology exists that makes this possible: by capturing a person's skin with a camera and magnifying it extensively, subtle color changes can be measured to estimate the heartbeat.

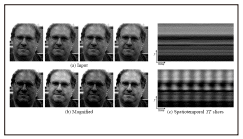
This becomes possible because our bodies are filled with blood. Every time the heart beats, the blood vessels contract, and the concentration of hemoglobin in the blood rises. Hemoglobin has a tendency to absorb green light, so as the blood vessels contract (and the hemoglobin concentration rises), the skin's color subtly changes. This change is imperceptible to the human eye, but by analyzing high-resolution camera data, the heartbeat can be estimated.

There are also examples beyond the heartbeat that capture things one might prefer to remain unnoticed, such as the motion caused by breathing or the motion of fat. A new type of motion capture technique records this, where the person being recorded wears a checkered-pattern suit. Multiple cameras capture the pattern, and the expansion and contraction of the body's surface is measured, storing the movements as data.

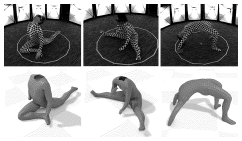
The "checkered pattern" is vital to this technology. Perhaps you've noticed a distortion in thin-striped clothing and felt disappointed by appearing larger. When wearing detailed patterns, it becomes easier to understand body shape and movement due to the stretch of the fabric. The checkered-pattern suit utilizes this principle, and this is similar to the ZOZOSUIT service, where a polka-dot suit is worn, and body dimensions are automatically measured by photographing oneself with a smartphone. This service operates by measuring how the polka-dot pattern distorts.



The technology to estimate heart rate from a webcam originated from a study conducted by MIT Media Lab in 2010. *1

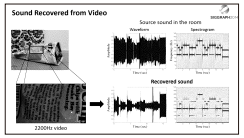


Research has also emerged to measure breathing and heartbeat rates from video frame differences, using the idea of "Eulerian Video Magnification". *2



Research involving tight-fitting bodysuits marked with symbols and patterns, captured by 16 cameras, and complemented with machine learning, storing movements down to the surface level. *3

Developed by ZOZO, a large online apparel retailer, this suit allows easy measurement of the entire body shape. Initially envisioned with sensors, the released version changed to a tight suit with a dot pattern, measured using a smartphone camera. ZOZOSUIT 2's release has been announced, with a shift in focus from casual clothing promotion to health care. *4



Research showed that when sound is present, objects vibrate in response. By capturing these vibrations with a high-frame-rate camera and estimating the received sound, the sound or song can be restored to a level recognizable to people. *5

In this way, both what's happening inside the body and what's occurring on the surface can be laid bare through the use of high-resolution eyes.
In addition to examples related to the human body, there are various other forms of "visualization". One such approach could be described as "seeing sound". Research is progressing on reconstructing sound from a place, based on silent footage taken there.

When you go to a loud live music venue, you might experience your skin tingling and vibrating due to the sound pressure. This is because sound is a vibration of the air. Everything within the range of the sound is subtly trembling. Of course, just like the "fluttering" of the heart, it's impossible to perceive this with the human eye. However, with high-resolution imagery taken at high speed, these faint vibrations can be measured, and the sound can be recreated.

Seeing heartbeats, observing movement, visualizing sound. Up until now, we've touched on examples where we're closely observing phenomena with clear underlying principles through the eyes of technology.

Understanding Tacit Knowledge

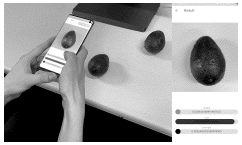
Meanwhile, there have been efforts to “visualize intuition”, so to speak. This involves attempts to replicate the “classification work based on tacit knowledge” performed by experts known as “connoisseurs”. Deep learning is mainly used in this approach.

An example of this is an application that tells you when an avocado is ripe enough to eat, just by taking a photo of it. Determining the perfect ripeness of an avocado only from its appearance is a difficult task. In this research, deep learning was used to study the stages of avocado ripening, and they succeeded in automatically evaluating avocados just by studying images.

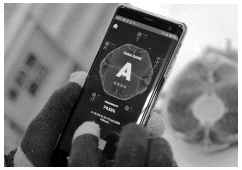
Another example is an application that measures the quality of tuna by simply photographing a cross-section. This service became possible by using deep learning with data provided by tuna connoisseurs.

Interestingly, even for those things where underlying principles haven’t been explained or formalized, if there’s a massive amount of training data, deep learning can achieve a “fairly good” accuracy rate. This is what makes deep learning fascinating.

Like the latest technology, we, too, are living every day, perceiving the invisible. We might notice a slight change in a friend, sense the approaching of rain somehow. Everyone probably has experiences of realizing something without being able to show a



It’s difficult to understand the ripeness of an avocado from the outside. The system evaluates it in three stages using deep learning, based on a photograph taken with a smartphone. *6



Similar to expert judgment, the system predicts the quality of tuna from a cross-section of the tail. Currently, it exceeds 90% in accuracy. *7

clear logic. At that moment, we’re comparing various elements within the vast information we recognize with our past experiences, and then touching the underlying, folded information of what we saw.

The resolution of images that machines can capture has surpassed human perception. Deep learning technology has also evolved. What has become possible through these two revolutions is the extraction of information embedded in images or videos. With the help of computers, it’s now possible to “show” things that humans usually cannot clearly perceive.

What information is embedded in the world? And how can that folded information be made readable? The technology to see the unseen is indeed one of the hot research areas that scientists in the field of computer vision are currently exploring.

So far, we’ve introduced technology to see the unseen. With the evolution of resolution and deep learning, we can now stand outside our own cognition.
But what will people’s lives be like when the desire to “see everything” is completely satisfied? A world where everything is in sight, and all objects are in focus, where “all” information is immediately available. Living in such a world may, perhaps, be very painful. In the final chapter, let’s introduce technology to “safely close” the new eyes obtained through the evolution of resolution.

*1
“Cardio Cam”, Ming-Zher Poh, accessed 29 November, 2021
https://vimeo.com/12192224

*2
“Video Magnification”, MIT CSAIL, accessed 29 November, 2021
http://people.csail.mit.edu/mrub/vidmag/

*3
“Capturing Detailed Deformations of Moving Human Bodies”, Anka Chen, accessed 29 November, 2021
https://www.youtube.com/watch?v=KRNYK3M7l1Q

*4
「あの ZOZO が、新型計測用スーツでヘルスケア連携を模索するワケ」, Mayuko Uno ,『日経 BP Beyond Health』
2021 年 Vol. 4, pp.62-66

*5
“The Visual Microphone: Passive Recovery of Sound from Video”, Abe Davis, accessed 29 November, 2021
https://www.youtube.com/watch?v=FKXOucXB4a8

*6
“アボカドの食べ頃診断アプリの開発”, 中京大学濱川研究室 , accessed 29 November, 2021
https://www.youtube.com/watch?v=LVav_ZwN8w0

*7
“TUNA SCOPE – 匠の目利きを、AI に託す”, accessed 29 November, 2021
https://tuna-scope.com/jp/

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Closing the Eyes

As we’ve become able to see various things, are we really able to “see better” than before?
To survive the days ahead, how we use these new eyes is crucial. In the final chapter, we’ll introduce examples of experiences where high-resolution technology has been skillfully utilized.

From a Chance to a Choice

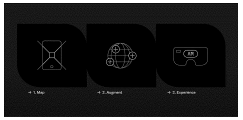
Why do we feel tense when faced with a camera lens? Even in the modern era, where visual communication through platforms like Instagram and TikTok has become widespread, behaving naturally during “filming” remains challenging. But what if the entire process of filming were handled by a system? Would the awareness of the subject change?

TOTOC is an application that, simply by placing a smartphone in a room, can automatically record videos of family members or pets. AI determines whether people or pets are nearby and begins filming, automatically stopping when the subject is no longer visible. This could be seen as an example where the concept of a “decisive moment” has been taken over by an algorithm.

As the term “decisive moment” suggests, photographs have been regarded as captured moments. This concept is now evolving.
Google once released a wearable camera called Google Clips, an experimental attempt that could be described as a human version of a dashcam. It would film everything in daily life and then extract “important-looking moments” through an algorithm. Similar to this example, in the not-so-distant future, some form of “filming” may become as ubiquitous as the air around us.
From aiming for a decisive moment—a “chance”—to finding the optimal one from a vast database—a “choice”, a new way of documenting, unachievable by merely viewing all the data, is beginning to emerge.

An iOS camera app. Developed from the idea that “children suddenly make gestures or chat”. “And usually, by the time I’m ready with the camera, it’s too late, so I’d rather just keep the camera active and record everything.” *1

Google Clips was a hands-free camera that used AI technology by Google. It was designed to trigger the AI to capture decisive moments of nearby people or pets. The product’s sales ended in 2019. The technology of Clips has now been integrated into the automatic shooting feature of Pixel’s camera. *2



Aiming to realize AR cloud, the importance of Visual SLAM (Simultaneous Localization and Mapping) technology is growing, not only for estimating direction in space through a camera but also for accurately identifying a user’s location. *3

A system for specifying targets through eye movement when using voice commands. By using both the front and back cameras of a smartphone, it estimates the head’s direction from the front camera, and determines which direction the gaze is pointing at in space from the back camera. *4

Seeing and Knowing

How convenient would it be if information could be directly inscribed into what we see? For example, a heart icon indicating a match appearing above someone’s head, or arrows materializing at a confusing intersection. Living and searching might become more seamless than ever before. In the field of AR (Augmented Reality) technology, efforts are expanding to display information in actual space.

Immersal provides a library that can naturally synthesize information in space by determining “where the photographer/videographer is and what they are looking at” from the camera’s image. This technology reportedly offers more accurate location and orientation information than GPS.

By utilizing technology that accurately understands a user’s location and gaze, systems can also intuit a user’s requests. For example, when operating a smart speaker, we must speak very clearly, for example saying, “Alexa, turn off the room lights”. If we could just say “turn off”, the awkwardness might be greatly reduced.

Researchers at Carnegie Mellon University introduced WorldGaze in 2020, a prototype that uses both the front and back cameras on a smartphone to gauge a situation. The front camera analyzes the user’s gaze, and from what is seen by the back camera, it determines “what the user is looking at and what interests them”. Then, it provides information about what is at the focus of the gaze. Using this technology, a voice assistant that “intuits” our interest without explicitly

expressing subjects or objects in words could become possible.

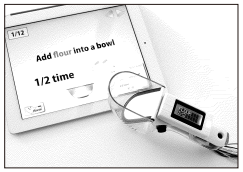
In the future, just looking at the scenery through a smartphone's camera will likely allow us to find friends' locations or discover available restaurants. A world where information previously obtained through "searching" is now acquired merely by "seeing" is approaching.

No Need to See

The last introduction is to an experience designed with the idea that you don't need to see or decide. As one might reflexively answer "anything's fine" when asked about dinner options, the continuous small decisions we make in daily life can lead to stress. Therefore, an approach is emerging that learns human behavior and habits from collected data, providing services with minimal interaction.

For example, there's the measuring spoon called Smoon, which changes its capacity in conjunction with a recipe, allowing you to simply scoop the exact amount needed. It's a novel attempt to entirely omit the step of measuring.

Or there's the Amazon Dash Replenishment service, which automates the act of restocking itself. Integrated with smart home devices, the system measures the amount of daily consumables used, and automatically reorders them from Amazon when they're about to run out. Measurement is done automatically, so users become almost unaware of the function.
Seeing, investigating, and deciding are acts of joy



A measuring spoon that automatically adjusts its capacity according to a digital recipe. Many acts of reading and measuring proper portions are required when cooking according to a recipe, which can be difficult for beginners. This spoon-like device that adjusts its capacity in accordance with the recipe allows the user to scoop the right portion effortlessly. *5

A system that measures the usage and remaining amount of consumables through sensors installed in appliances and other products. It automatically places orders with Amazon when the supplies run low. It appears to be an evolved version of the "Amazon Dash Button", a one-button push ordering system introduced in 2015. *6

The term "Internet Addiction" began to spread worldwide around 2013. Entrepreneur Anil Dash introduced the concept of "JOMO (Joy of Missing Out)" in response to "FOMO (Fear of Missing Out)", a term which had become symbolic of "Internet Addiction", and it became a topic of discussion.

Before her suicide in 2017, Molly Russell's Instagram feed had become inundated with a large number of images related to suicide and self-harm. All of these images were recommended by the algorithm.

but also a burden. By reducing them in appropriate places, we might be able to save our consciousness for more important activities.

As we have seen, the detailed eye of technology — high-resolution information— harbors various possibilities. But merely focusing on the evolution of resolution doesn't drastically change people's lives. What needs to be investigated is the experience. What kinds of experiences do we want to design using this new eye? How do we want to change people's behaviors? Whenever new technology appears, we face the same questions.

As an answer to these questions, focusing solely on "convenience" or "trendiness" might trip us up. Social media and social games are now occupying most of our consciousness, and are facing ethical crises, prioritizing quick convenience. As a result of continuously emphasizing the metric of "how much user attention can be sustained", people are falling into addiction, where they can't quit the service of their own volition. Even user deaths could occur as a consequence. That this expression is neither metaphor nor exaggeration is clear from the lawsuit by Molly Russell's father. Technology can cost human lives.

We, who have gained the eye that sees everything, might not be aiming for a design to "see everything". The design to see what should be seen and to be able to close our eyes safely is what seems to be needed. When the eye that captures the external is closed, we might find another "measure" within ourselves. At that moment, the world's resolution reaches a new dimension.

*1
“【個人開発】AIで人やペットを自動で撮影するアプリ「TOTOC」をリリースしました”, その後のその後 iOSエンジニア堤 修一のブログ , accessed 29 November, 2021
https://shu223.hatenablog.com/entry/2021/10/10/132659

*2
“Google Clips”, Google Play, accessed 29 November, 2021
https://play.google.com/store/apps/details?id=com.google.android.apps.cerebra.links

*3
“Immersal”, accessed 29 November, 2021
https://immersal.com/

*4
“Enhancing Mobile Voice Assistants with WorldGaze”, Future Interfaces Group, accessed 29 November, 2021
https://www.youtube.com/watch?v=kjACtQK3D-k

*5
“smoon: 計らなくて済むスプーン”, Keita Watanabe, accessed 29 November, 2021
http://www.persistent.org/smoon.html

*6
“Amazon Dash Replenishment”, Amazon Japan, accessed 29 November, 2021
https://www.amazon.co.jp/Dash-Replenishment-%E8%87%AA%E5%8B%95%E5%86%8D%E6%B3%A8%E6%96%87/b?ie=UTF8&node=4830978051

You can refer to this collection of references, including the sources introduced in “Closing the Eyes,” as well as related examples that could not be fully covered in the print edition, via the 2D code on the right.

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Editors' Dialogue

—When was the moment you felt that "resolution has improved" recently?

Izumida A little while ago, I was impressed when LiDAR was implemented on the iPhone. I was looking at properties for my office and being able to scan the interior of a property with LiDAR for anytime viewing was simply amazing.

Ikeda Being able to fully capture and record a given space using the iPhone's LiDAR has greatly enhanced convenience in various scenarios, hasn't it?

Izumida Initially, the inflation of the resolution of photos taken with smartphones led to the ability to record almost everything on a phone, which has a strong "changing everyday experience" feel to it. Now, you can even shoot a movie with an iPhone, fostering a creative environment for teens.

Ikeda Yeah. It's safe to say that smartphones have significantly changed the meaning of photos and videos.

Izumida The fact that it's become handy, and intertwined with the commonly used tool, the telephone, is a big deal.

Tsuchiya Indeed. When Olympus released the first half-size camera in Japan, the key message was, "No matter how beautiful a photo you can take, it's meaningless if you don't have a camera". But now, since smartphones are cameras, the situation where "you don't have a camera" has almost disappeared.

Nakano If surveillance camera resolutions improve further and digital twin technology becomes more advanced, the state of "not having a camera" might return. You can just extract what you want later if needed.

—Improvements in resolution and the maturing of AI technology. What areas do you think are likely to see innovation in the future with these changes?

Shimizu Workouts.

Ikeda Workouts, yes. There's personal analysis, isn't there? What used to require experts to examine can now be done automatically, and the scope of application will explode.

Tsuchiya Yes. Physical and mental "conditioning" seems to have good compatibility with the technology in this field. For example, designing algorithms for routines that make "getting in the zone" easier in the sauna, or proposing moderate routines for training.

Shimizu Exactly. There are some "hackable" aspects to building muscles, so I think techniques that cannot be rationally deduced without AI might be discovered. This might enable humans to build muscles more easily. Specifically, combinations of diet, temperature, and biometric data might come into play.

Izumida Also, there's the pure idea of augmented humans. I want to be able to feel things that are invisible or imperceptible.

Nakano If we could see the microbes in the city with AR glasses, it might change our notion of ecological abundance and hygiene.

Morioka It seems likely. With sensors and AI, I feel we are gradually moving towards being able to detect anything.

Tsuchiya Looking at the recent accuracy of automatic translation technology, I have a feeling that if voice recognition technology and speech synthesis technology become faster, human augmentation technologies, like the "Translation Gummy" (a magical gadget in Japanese comic "Doraemon" which enables user to be able to speak and understand other languages) will finally reach practical levels.

—Even with improved resolution, are there things that you think will remain unchanged?

Shimizu Love. Is there a resolution to love in the first place?

Ikeda Is love measurable?

Tsuchiya It does feel like AI technology has now completed a suite of techniques to forcibly quantify things like love that cannot be measured numerically. From past data, you can statistically measure whether something seems like "love" or not. In that sense, the word "emoi (emotional)" feels very much of the times, I think.

Izumida No matter how hard we try, the evolution of the human body itself takes a long time, so it won't change. Conversely, that's why technology advances in the direction of human body hacking.

Nakano There's a book with the theory that the human body is still at version 1.0, isn't there?

Tsuchiya Indeed, that's true of the human body, and homes. Since homes aren't replaced frequently, we try to retrofit them with devices to make them smart. Cars are the same. There will always be a market for adding functions and trying to keep up with the latest features.

Ikeda In a meta-structure, our stance towards the things of the previous era doesn't seem to change. In human and cultural endeavors, it might be something that hasn't changed since ancient times.

Morioka Yes. Also, things like politics, economics, life, and culture, which lack reproducibility and have strong singularity, are difficult to repurpose. I think this can be said of any field.

—What are your expectations for the readers of "THE TECHNOLOGY REPORT"?

Ikeda I hope it becomes a catalyst for people to want to know more about what technologies are involved in things they want to realize. I also hope that it serves for the distance between thinking and creating to significantly shrink.

Nakano An increase in projects and efforts for a better future.

Morioka The importance of "making with your own hands".

Izumida I would be happy if there are more realizations in daily life. The way we casually look at things in everyday life changes when we are aware of the technological backbone. That might be exactly what it means for resolution to increase.

Tsuchiya Not just using technology as a buzzword but touching on the "thinking" behind each technology. From that, having a chain of ideas born that says, "Maybe this or that can be done, too".

Shimizu I hope they have the impression that "I can understand and talk about this myself" and that it functions as a good kind of "secondhand story". That might be the true purpose of "THE TECHNOLOGY REPORT".

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THE TECHNOLOGY REPORT
https://the-technology.report/

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