

PERSPECTIVE

Technology

*In the 21st century, technology is a crucial part of our daily lives.
How do these innovations impact different aspects of society,
and what harms or benefits do they bring?*

Dux vol.6

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01

EDUCATION

- Three Ways Technology Will Change Higher Education
- Technology - Books vs. E-Books
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Three Ways Technology Will Change Higher Education

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Higher education, meaning tertiary education such as university, college, and graduate school, has been pretty static in terms of curriculum over the past numerous years.

Now, however, as a result of the demands of Generation Z students as well as the rapid advancement of technology, universities are startings to come up with improvements to help people learn more effectively, match their skills with jobs and lower their costs.

● College by Subscription

One of the biggest changes in higher education would be the way students pay for tuition. Instead of enrolling in a university, for example, students may be able to subscribe for a monthly fee and take the courses they would like to take, whenever they want to. Doing this would allow students to move through their academic career at their own pace, whether that might be faster or slower.

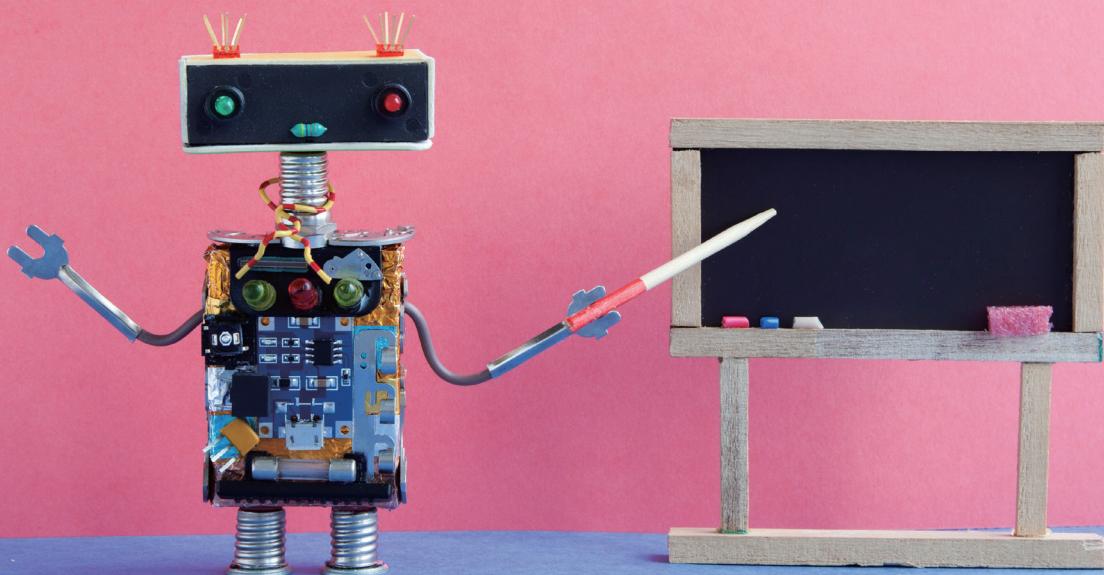
The Georgia Institute of Technology and Boise State are one of the few higher academic institutions that implemented this program. At Boise State, this program costs \$425 a month for six credit hours or \$525 for nine in either of two online bachelor's degree programs. That's 30 percent cheaper than the traditional

method of tuition.

This system will encourage students to live a healthier academic lifestyle. Research suggests that most students who sign up for this program graduate within 18 months.

● A Robotic Teacher

Georgia Tech has also implemented a virtual teaching assistant by the name of Jill Watson, built on the Jeopardy-winning IBM Watson supercomputer platform. This robotic teacher is able to answer questions in a disucssion alongside other



non-robot teaching assistants. The university is working next on developing virtual tutors, which it says could be viable in two to five years.

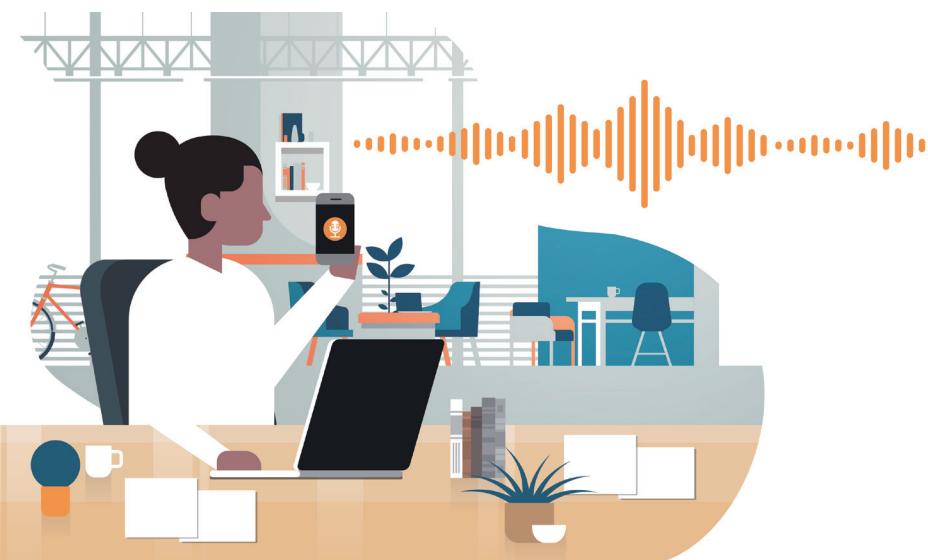
S.N.H.U. is testing A.I. grading. Barnes & Noble Education already has an A.I. writing tool called bartleby write, that corrects grammar, punctuation and spelling, searches for plagiarism and helps create citations.

Slightly less sophisticated simulations are being used in schools of education, teachers in training practice coping with simulated schoolchildren. Engineering students at the University of

Michigan use an augmented-reality track to test autonomous vehicles in simulated traffic.

● A Transcript for Life

The way students' learning get documented is also subject to change. With



technology being rapidly advanced, transcripts may last a lifetime. Traditional transcripts don't include internships, apprenticeships, or other relevant experiences that show what a student has taken a part in, and courses with names like Chemistry 301 show very little about what students might actually have learned.

This is called the "interoperable learning record," or I.L.R. The I.L.R. would list the specific skills that people have learned as opposed to which courses they passed. And it would include other life experiences they accumulated. Unlike traditional transcripts, I.L.R.s would be helpful when prospective employers are looking to hire, they could also help employees themselves to search for jobs that they would be strong at.

This type of record would remain in the learner's control to share with their employers and also make it easier for a student to transfer their academic achievements and credits from one institution to another.

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Technology - Books vs. E-Books

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While the popularity of traditional paper books remains strong, the e-book has made significant inroads. Where does the future of publishing lie?

The most common reason for favoring the traditional book comes from the actual physical form of a book. Many readers enjoy the touch of crisp paper on their fingertips and the satisfaction that comes with turning actual pages. In addition, paper books do not require power which makes it much more accessible and convenient. And there are some that say that paper books are proven to be a lot more efficient in terms of digesting and retaining information.

On the other hand, e-books can sometimes be the better option. Since traditional books can be hundreds of pages in length and sometimes with a thick cover, physical size and weight is a factor. When books are too heavy, people tend to avoid taking them when traveling. However, e-books replace the bulk with one simple electronic device that can store multiple books. E-books do not take up any physical space, can store much more content, and are also accessible at all times. And as content is displayed on a screen, the reader is able to change the font style and size to make the text easier to read.

Also, a big consideration is that traditional books require the sacrifice of hundreds and thousands of trees. E-books are obviously much more environmentally friendly as they are paper-free. The absence of paper also makes the process of production

very cost effective and efficient as a whole, considering the fact that printing and assembly are not necessary. As a result, e-books are significantly less expensive. Another positive is that e-books never go out of stock, and they can be bought and read instantly as soon as the readers wish.

Despite the pros of e-books, the cons cannot be ignored. Since e-books are read on screens, readers will suffer increased eye strain especially with longer periods of use. The bright screen can be detrimental to the eyes, and it is proven that they can actually interfere with an individual's quality of sleep. Furthermore, although e-books have become more common, not all books are available as an e-book online.

Both traditional books and e-books have their own distinct advantages and disadvantages. Their unique qualities are why the two are able to exist simultaneously and have their own following and fanbase. Ultimately, the choice between books and e-books will be a matter of personal preference rather than whether one is better than the other as they fulfill different needs and have their own merits.

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Braille

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Before the braille unifications in 1878 and 1951, life for the visually impaired was very arduous as they could not read or write in the standardized language in their country, practically making them illiterate. With the French publishing braille in 1854, other countries around the world conceived their own languages for the blind. These domestic and tangible languages included Britain's Moon Type, Boston's Line Type, and New York Point. Although these languages were considerably effective, they were all replaced with braille by the second round of braille unification in 1951.

After the invention of braille in 1824 and the inclusion of braille in the French curriculum in 1854, the French Government finally and thoroughly acknowledged Louis Braille's work in 1952. From then, braille conducted to become universally accepted as the most effective language for the visually impaired. Today, several organizations such as the American Foundation for the Blind and the Braille Institute of America exist to teach braille to young ones with visual impairment. With the help of modern technology, braille can not only be used to read publications such as books and signs but digital texts as well. Braille has played a significant role in the lives of the blind today as they now have a language that is invariably accepted by everyone.

Braille is read from left to right, usually with the index finger. Both hands are usually involved in the reading process. Braille bases on a 12 dot cell, where

different combinations of raised dots in the cell represent a letter, punctuation mark, or number. Using braille, blind people can become aware of different conventions such as spelling, punctuation, paragraphing and footnotes. Braille can be broken down into 3 different grades: Grade 1, 2, and 3.

Louis Braille was a French educator who is known as the father of braille. Louis lost his vision at the age of 3, and he attended the Royal Institute for Blind Youth in Paris where he was introduced to a new language for the blind: Night Writing. When Louis was 15, he edited Charles Barbier's Night Writing into a new language he dubbed braille. Louis Braille published braille in 1829, but braille was not included in the curriculum until 1854, two years after Louis Braille's passing. In 1952, Louis Braille's work was finally recognized by the French Government.



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| 02

BIOLOGY

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- ChIP-Seq: Revolutionizing the Study of Genomes
- Benefits of Technology in Healthcare
- Delivery Boom Amid COVID-19
- The Synergy of AI and Neuroscience



Advancement In Medical Technology

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As the population increases, the more health problems happen and the newer diseases continue to appear. But at the same time, medical technology is developing to prevent increasing health problems. Medical technology has been developed to a great extent over the many centuries, and in the medical field of health and healing, including doctors, nurses and other various specialists are continuously developing medical technology and expanding the knowledge of diseases to improve our quality of life.

There are a lot of benefits to us by the hi-tech systems in the medical field. It helps us to have less pain, fewer costs for treatment, and allowed having a quicker diagnosis and increases survival probability. Furthermore, state-of-the-art medical technology, doctors to have better-detailed information about the patients and allowed the surgeon to do more complex surgery, which can prevent the patient's health from deteriorating in advance. In fact, according to the World Health Organization (WHO), the global average life expectancy increased by 5.5 years in 2016 compared to 2000. For this result, there can be various reasons, but advancement in medical technology can be one of the main reasons.



What are some examples of advancements in medical technology? Artificial organs, as the 3-D printer developed, we're able to make artificial organs such as blood vessels, synthetic ovaries, pancreas, and much more. Furthermore, these artificial organs are not rejected by the body's immune system, so it will be able to supply the same as real organs. As a result, it has positive great aspects in the medical field. For example, in the United States, about 114,000 people are currently on the waiting list for lifesaving organ transplants. It is about adding one more patient on the waiting list every 10 minutes. But because there are not enough organs to cover the number of patients on the waiting list, about 20 people die every day. As a result, we are able to create a lot of artificial organs



by using the 3-D printer, we can save more than a million patients who are dying because they have no transplant organs. Another example of advancement in medical technology can be robotic surgery. Robotic surgery is one of the most representative examples of the development of medical technology, and robotic surgery is a medical technology that is likely to further develop in the future. Because robotic surgery takes minimally invasive procedures and it is more precise, controllable, and more flexible than humans have, surgeons can perform more complex procedures more precisely. Also, as robotic surgery allows doctors to succeed in more difficult surgeries with a higher probability, it will be more advanced over time. In fact, according to a report published by P & S Market Research, the personal robot market in 2022 will grow to \$34 billion, which is



expected to further advance medical robots. They believe that by adding AI voice technology and virtual reality, more medical robots will be operated.

Consequently, as continuously improving medical technology, State-of-the-art medical technology allows us to know the patient's condition in more detail than ever before and prevent your health from deteriorating in advance. By this, we can have an even better life quality, and we all should get more interested in and support the development of developing medical technology to have a better life. Better quality of medical technique, better life quality we can get. We all hope our medical technology can keep continuing development, and we can keep the good quality of our life.

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Human Cloning and Genome Editing is a Threat

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With the development of technology and knowledge of cloning and genome editing, scientists are getting relatively close to human cloning. Recent studies in Hong Kong even proclaimed that monkeys are officially cloneable and genetically editable. However, if humans were to get cloned, what moral and ethic harms would it have to our society? By a threat to morality and ethicality, I mean the threat to true meaning in life and the abusive power one can possess with such technology. With the threat to these assets in society, there would be major chaos, globally.

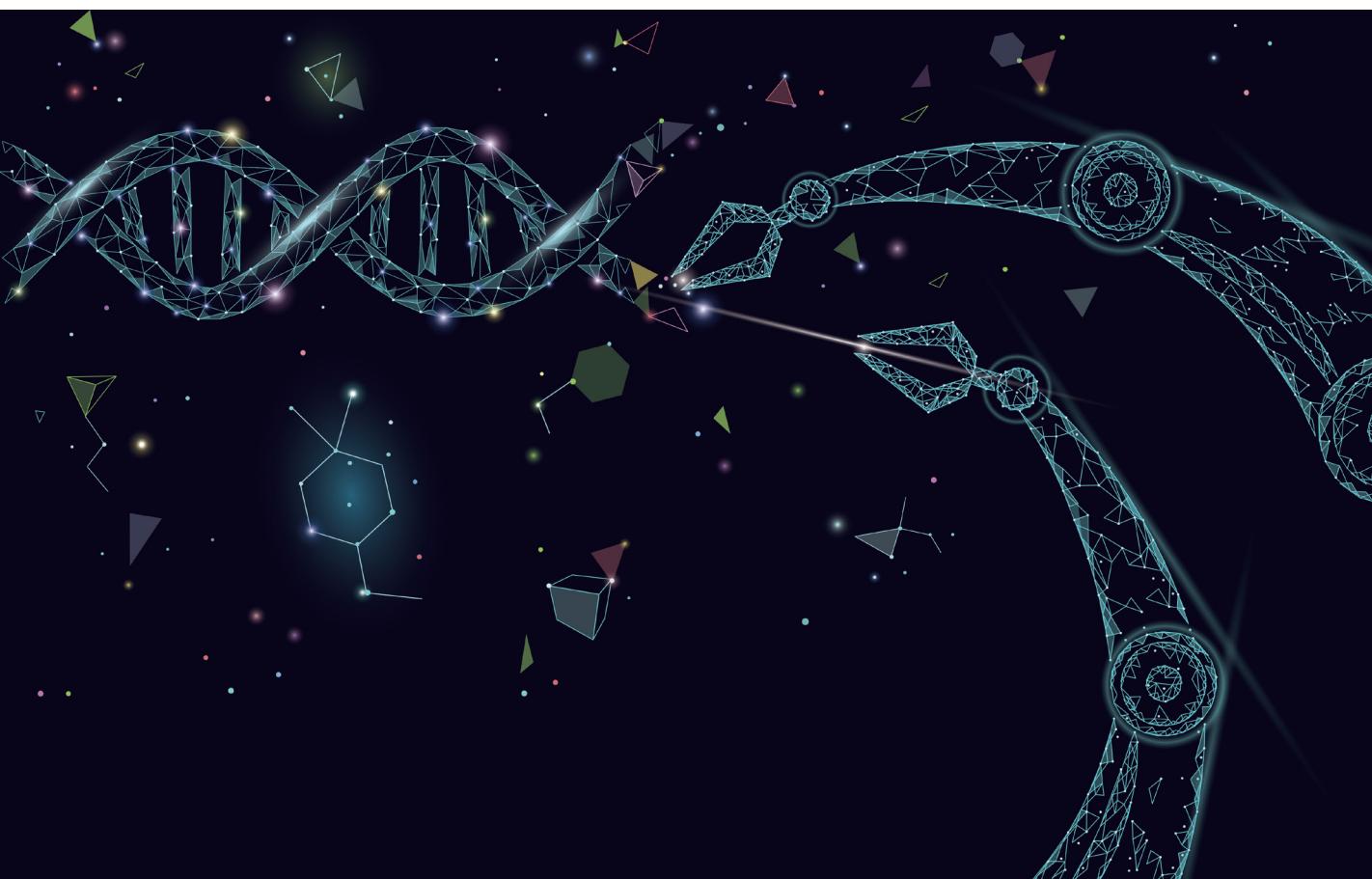
Human cloning and genome editing technologies may easily erase the importance of each individual's life. Let's say that Bob, a rich white man near his 40s decides to clone himself, just for convenience. His clone is driving a car and crashes in with a delivery truck which takes his life. Here's what Bob is thinking: Well I could always get another one. That is one ending. Another way that story could've ended is: When the clone isn't driving the car, and the normal copy of Bob is driving. Just like the clone, he dies. Here's what his family, friends, parents, or any loved one's are thinking now: Whatever, he was just one of them. Now with the power of gene manipulation, this is very likely, and it is unacceptable as it ignores the importance of one's existence. Very soon, everybody in the world will probably be like Bob. Maybe not white, not rich, not near their 40s, but

forgotten. In the shadows of clones.
In the illusion and questioning of true
existence.

Considering the fact that human cloning and genome editing causes the loss of importance in life, this can also lead to wealthy and powerfull individuals abusing this technology.

According to The Conversation,

most people when hearing the word “clone”, think of the abuse of the technology. Specifically the abuse of power from those who are willing to harm with major armies of clones. Criminals. Fighters. This could also happen with gene editing as a baby can be edited to be specifically be good at combat, or shooting a gun. This shows the possible abuse of



technology for warfare and weapons. Suspectedly, major terrorist groups such as ISIS or Boko Haram. Therefore, human cloning could start an economic war, where the side with more gene modifying technology wins. This is also believed to be the probable World War III.

Now, it is definitely true that human cloning and genome editing makes life more convenient and everything more efficient. You have clones driving Ubers, clones working in factories, etc. However, this is the same as saying that the world becomes more populated. Well yes, that may be a good aspect in a way for some places in the world, but for others, it can create water and food shortage. For South Korea, it would be great news as it is expected that by 2750, South Koreans will go extinct. However, for China, the government is wanting lower birth rates because of overpopulation. Unfortunately, such technology is not that easily controlled. Genome manipulation is global, and efficiency or convenience in life will not matter if water and food shortage is to come.

Human cloning and genome editing is truly a spectacular technological success, but it is clearly not ethical nor moral. Waiting for it to be established is the same as awaiting for chaos. If such technology is to be established – and there is no chance that it will not be established – the world could experience so much damage: the loss of importance in existence, abuse of power and technology, and even resource shortage. This is not just another revolutionary piece of technology. It is the way the Earth may be destroyed. Ethically and morally.

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ChIP-Seq: Revolutionizing the Study of Genomes

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In the modern context, analysis of the genome is considered to be the most efficient for advancements in biology. Repeatedly, it has been established that nearly every aspect of an individual organism can be traced back to its DNA. The genetic code regulates everything that makes the organism an organism: from expression of phenotypes to embryonic development, all information is stored in the genome. Furthermore, the beauty of the genome is that it can be organized into discrete nitrogenous bases - A, T, G, C for DNA and A, U, G, C for RNA - which creates a viable basis for computational analyses. The development of various bioinformatic technologies is making it possible to create the link between the biological and computational aspects of the genome.

Combining Next Generation Sequencing (NGS) and Chromatin Immunoprecipitation (ChIP), collectively labeled ChIP-seq, produces a very powerful tool for mapping protein-binding sites along the DNA. ChIP-seq is thus capable of providing insight into the mechanisms of gene regulation: the relationship between the genome, proteins, and expressed phenotypes. Furthermore, compared to alternative methods such as ChIP-on-ChIP, ChIP-seq is considered to be more valuable because of the lack of sequencing-bias and the fact that prior knowledge of the genome is unnecessary; benefits integral to massive parallel sequencing. It is able to precisely generate millions of counts,

making it a popular cost-effective method.

Together, these two advanced tools produce multiple advantages that are unprecedented in this field of study. Chromatin Immunoprecipitation – in short – operates by using specific antibodies to precipitate cross-linked DNA fragments and associated protein of interest. As a result, it can isolate specific regions of interest within tens of base pairs of the actual site. In addition, recent developments in NGS allow scientists to accurately sequence millions of DNA fragments on a single run. Thus, when used simultaneously, DNA-binding sites can be mapped easily onto the genome and computational analysis can be executed on the obtained sequences. An important benefit is that ChIP-seq is compatible with the genomes of various different organisms *in vivo*, as well as different forms of data input.

The significance of this bipartite tool is that it pioneers modern research of gene regulation in relation to genetic diseases and biological pathways. With greater accuracy and computational power, the depth of understanding of diseases such as cancer and their development increases. Such technology has the potential to produce solutions to diseases of the like that were originally thought to be critical to the human body. By discovering the underlying genetic causes, it becomes easier to develop countermeasures before such phenomena occur.



ChIP-seq encompasses chromatin immunoprecipitation and next generation sequencing, both of which have multiple steps of their own.

ChIP-seq is initiated by the former, chromatin immunoprecipitation. This process is done for a specific protein of interest, and it most commonly involves transcription factors or histone modifiers. Specifically, the aim is to determine whether a certain part of the genome is associated with the target protein, possibly mapping out the cistrome. These DNA-protein interactions are vital to “recombination, repair, segregation, chromosomal stability, cell cycle progression, and epigenetic silencing” [1].

The first step of chromatin immunoprecipitation is the fixation of the protein with the chromatin. The fixation of cross-linked DNA and protein is often achieved through formaldehyde, which is optimal due to its efficiency, compatibility with a wide range of protein targets, and reversibility [2]. Fixation by formaldehyde is easily reversible by heat, a characteristic that is exploited in later stages of isolation.

Once the cross-links have been successfully fixated, the chromatin is broken or “sheared” into multiple small pieces, either through sonication or nuclease digestion. It is imperative that the fragments are small (100~500bp) in order to pinpoint the locations of cross-links [1]. Multiple trials across different methods have also demonstrated that longer fixation protocols result in less successful sonication results [3]. In addition, depending on the type of sonicator used, the duration and intensity of sonication needs to be optimized.

Once the chromatin has been fragmented, the fragments that contain cross-

links need to be identified: this is done through precipitation via antibodies. Also known as immunoprecipitation - because it precipitates fragments using antibodies - this is the most important part of the process. Again, it is important to note that the success of ChIP is highly dependent on the type and amount of antibodies that are used [3]. Much of these optimalities are determined empirically.

To complete the process, the fixation is reversed to isolate and purify protein-specific DNA fragments. As mentioned, since formaldehyde-induced cross-links are easily reversible, incubation at 68 degrees Celsius for 6 hours is enough to separate the proteins [1]; it is the simplest step of ChIP that requires the least optimization. Subsequently, the protein is digested and the ChIP DNA is purified - residuals are removed - through the usage of distilled water. Often, these final fragments are amplified by PCR before being sequenced through NGS. PCR helps to provide a leeway to computational analysis, as well as an insight into the level of enriched DNA of a ChIP sample [4]; this is descriptive of the efficiency of the ChIP protocol.

Because ChIP is composed of multiple steps and factors, it is subject to a lot of variability. Thus, it is critical that each of these steps are optimized in order to yield optimal results [5]. Rigid control over the variables in each step directly correlates with higher quality in the results. Different types of ChIP also have inherent advantages and disadvantages, which will be discussed later on, pertaining to the overall efficacy of ChIP-Seq.

The results of ChIP is compatible with various biology tools such as different forms of PCR, Southern blot analysis, Western blot analysis, microarray, and so on

[1]. In ChIP-Seq, they are paired with NGS, which sequences and quantifies the results, thereby facilitating computational analysis.

The capacity of high-throughput sequencing analysis provided by NGS allows users to simultaneously sequence all the ChIP-DNA fragments that have been enriched and purified, as well as to investigate the entire genome for binding sites [6] with high resolution. Though there are numerous different types of NGS, they all operate by sequencing millions of shortened DNA fragments in parallel [7]. Unlike its predecessor, Sanger Sequencing, which can only sequence one fragment at a time, NGS can do millions, making it a faster, more cost-efficient option for sequencing ChIP-DNA.

While it is one of the most accurate forms of bioinformatic tools on the frontier of biological research, ChIP-seq's processes entail certain inherent biases into its results. Much of this arises from the chromatin structure itself. Since the structural characteristics of chromatin are non-uniform, its fragility varies depending on location. Furthermore, different methods of sonication produce different fragment sizes, resulting in sample-specific bias. PCR amplification is also largely dependent on the DNA sequence content, as well as the temperature, buffer, and polymerase that is used. Mapping reads on a reference genome that seem ambiguous or repetitive is also algorithm-specific. [8] These factors all introduce bias to the results of ChIP-seq, and it is necessary to introduce control groups and repetitions to mitigate such biases.

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Benefits of Technology in Healthcare

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Recently, technology has benefited healthcare noticeably. Much of the process we see in the medical field is due precisely to technological innovation. The impact of technology on healthcare includes three main areas: quality of human life, healthcare jobs, and the world economy. Fortunately, we can be certain that interest in medical innovation is not slowing down, but is increasing at an alarming pace. Among the advantages and

benefits of technology in healthcare, we can also count the decline in preventable death cases, along with the general improvement of patient well-being. Treatment and recovery time for doctors and patients have been reduced significantly. Shoulder to shoulder with these benefits, there is also an increase in the number of new career paths and job openings for medical workers.



Not only does medical technology affect one's personal quality of life, it also affects the lives of thousands of medical professionals and students training to become medical experts. There are substantial investments in the field of healthcare technology that not only help innovation, but also provide a number of high-quality jobs. New career choices such as EEG technologists, MRI technologists or surgical technologists are not uncommon these days. Additionally, these types of careers are on the rise and most have an average salary between \$40,000 and \$60,000 making them popular long-term professional tracks. Bio-engineering job openings are also steadily increasing. According to research, the cognitive analysis and computing market is expected to grow by 27%. This will inevitably lead to more accurate and faster data transfers, which means improved patient care and more job openings in both the IT/Tech sector and related healthcare sub-fields such as clinical internship and medical billing.

Even though technology may only seem to benefit the machinery aspect of it, it has a profound impact on the medical field and is a huge factor that saves many lives and allows the job of doctors to become easier and more comfortable. Surprisingly, it also has a productive impact on the economy and young people looking for long-term jobs. In conclusion, not only does technology have impacts on machinery and factories, it also has a noticeable effect on the field of healthcare and medical technology.

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Delivery Boom Amid COVID-19

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Even before the outbreak of COVID-19, residents all over South Korea have been dependant on the advanced delivery system of the country. You can get nearly anything, from groceries to spicy cheese tteokbokki to toilet paper, delivered to the front steps of your house in South Korea. This affinity for high-speed delivery has only increased with the emergence of popular delivery apps, such as Yogiyo or Coupang. Baedal Eui Minjok, one of the most popular delivery apps in South Korea, translates into “Country of Delivery,” and this statement has never been truer than during the winter of 2020.

With the outbreak of COVID-19 in South Korea, and the incredibly rapid spread of the virus following the infection of Patient No. 31 in Daegu, residents in South Korea have become increasingly wary to leave their houses and go out to public places, such as supermarkets and restaurants, in fear of interacting with a potentially infected individual. Consequently, a large portion of the population in South Korea is using delivery services and apps for access to daily necessities and cravings without being potentially contaminated with the virus.

However, a growing concern regarding these delivery apps is the health and safety of the “riders,” or the deliverymen carrying products to individuals’ apartments. Because deliverymen travel to myriad households per day, if they continue to operate through their job, unconscious of the virus consuming them, they can spread COVID-19 to countless individuals. Because of the risk the

contamination of deliverymen poses to the epidemic across the nation, these deliver apps have taken several measures to ensure the health of their employees and customers. For instance, Delivery Hero, which operates apps such as Yogiyo and Baedal Tong, has required the use of masks for all deliverymen, during working hours to prevent the spread of COVID-19. Furthermore, fried chicken stores such as BBQ Chicken, who heavily depend on delivery for sales, have promised to shut down stores if patients have visited one of their branches, and are requiring employees to use masks and highly sanitize themselves and the store itself.

In spite of efforts by delivery companies to ensure customers of the safety of their services, however, recent news reveals the validity of concern from customers of the health of deliverymen. The patient from Songpa-gu was revealed to be a deliveryman from delivery startup app “Baro-go.” He had visited the Park Habio branch of Baskin Robbins in Seoul for a delivery and proceeded to deliver products throughout the day without knowledge of being infected by COVID-19. Residents in Seoul now fear that people whose products were delivered by this patient may also be infected, and that Korea’s delivery system may be exacerbating the epidemic in the country.

With the future of COVID-19 still unpredictable, it appears that Korea’s advanced technology and delivery system is most residents’ best alternative



to going out into public places. However, with the proven risk of the delivery system, and considering how infected deliverymen can be “super-infectors,” it is clear that the safety and health of all citizens is being increasingly unstable amid current events.

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The Synergy of AI and Neuroscience

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Most of what we hear about artificial intelligence refers to machine learning, a subclass of AI algorithms that extrapolate patterns from data and then make predictions. Deep learning is even more powerful subcategory, where computational layers called neural networks (inspired by the structure of the brain) operate to increase processing depth and accuracy. Biology is one of the most promising beneficiaries of artificial intelligence and is showing great synergy with AI. From AI seeing more in microscopy than humans to imitating behaviours to execute in prosthesis, AI and neuroscience proceed to improve together.

Researchers at the Gladstone Institutes in San Francisco teamed up with Google to apply artificial intelligence to biology. Steve Finkbeiner and his colleagues invented a robotic microscopy system to track single cells over time. As it generates 3–5 terabytes of data per day, they also developed powerful statistical methods to analyze big data. Microscopy is a central method in life sciences, but is not easy to detect elements within a cell, because biological samples are mostly made of water. Scientists developed methods that add fluorescent labels to see features the naked eye could not. After some training, deep learning networks were shown pairs of labeled and unlabeled images, and were able to differentiate cell types and identify subcellular structures.

Chethan Pandarinath wants to enable people with paralysed limbs to use a robotic arm as naturally as they would for their own. He has collected data on



brain activity in people with paralysis hoping to identify patterns of electrical activity in neurons that correspond to the attempts to movement, so that the instruction can be implemented into a prosthesis. The effort revealed the brain's temporal dynamics, providing a more detailed instruction for better arm movement.

As more and more researchers investigate in this field, many questions arise relating to the slight differences between the AI neural networks and the neuroscience of our brain. One question is exactly how learning occurs as neural networks mostly perform supervised learning. To learn image recognition, they might be shown millions of images of objects that have been categorized and annotated. The networks develop a statistical understanding of what images with the same label have in common. When shown a new image, it examines for similar attributes. That is obviously not how we learn, says Tomaso Poggio, a computational neuroscientist at the Center for Brains, Minds and Machines. Another question is whether some aspects of intelligence are ‘inserted’ by evolution. An example is that people are predisposed to recognizing faces; infants can do so very early in life.

AI helps neuroscience by being a model for developing and testing ideas about the brain as well as being a tool for processing the complex data. Drawing

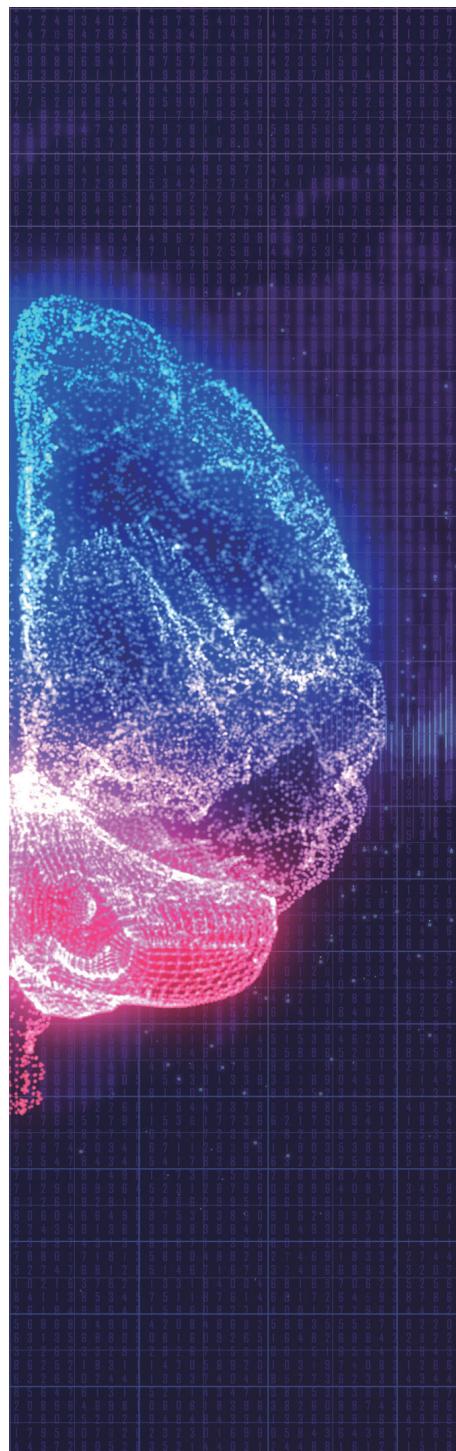
inspiration from neuroscience in AI research helps vindicate AI techniques and provide a rich source of inspiration for new algorithms and structures. Lessons go back and forth as it is vital for both fields to continue to build on, creating a virtuous circle. Even if AI output resembles the human brain, it doesn't directly mean that is how the brain works. Unlike AI, our brains are the result of evolutionary pressure and how we learn likely is linked to survival instincts, something that AI cannot capture yet.

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Citation

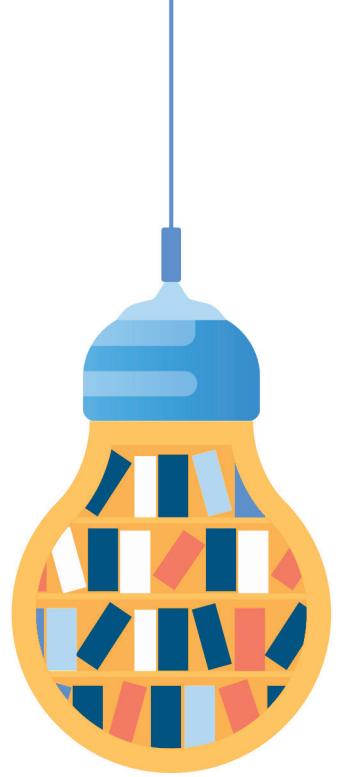
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03

CULTURE

- To what extent has technology changed the way people communicate?
- What would life be without modern technology?
- Segway Mishap: Is Technology Ever Perfect?
- History of Technology





To what extent has technology changed the way people communicate?

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In contemporary society, many people have used technical devices to do whatever they wish. It is no secret that as technology improved throughout the years, many people's lives are shaped by electronic devices. As communicating someone via an automated machine has been more comfortable than it ever was, there has been an insurmountable number of people who rely on communication totally through technological gadgets. More and more teenagers and children access the internet and communicate with their acquaintances through devices, and this trend does not seem like it'll stop any time soon. Technology has truly shaped the way we as humans communicate since some communicate only through email but not in person. Technology has massively impacted the way people communicate because of the impact of the new social media apps for people to communicate with each other as well as the way people use cell





phones to communicate with each other.

The first reason why technology has massively impacted the way people communicate is because of the use of new social media apps for people to talk. In the 21st century, making a social media account is exceptionally straightforward. Most teenagers who have access to a mobile device mainly has more than one social media accounts for a variety of different purposes. One of the significant factors on why teens make social media accounts is because using social media accounts is a convenient way to interact with people that an individual has never met personally. Many people across the globe make friends online that they have never seen before. These apps completely changed how people communicate as back in the days; apps like Instagram and snap chat were unavailable to the public. In current society, people would start building a relationship with someone whom they never met before, which is unimaginable just decades earlier.

The first reason why technology has massively changed the way people communicate is because of the use of cell phones. Back in the early 19th century, which is about two centuries ago, there was no real way of communication except talking to a person in real life. There were no phones present, so people could not call or email another person. However, this changed drastically over the course of the past 200 years. The first phone was created in 1876 by a well-



renowned inventor named Alexander Graham Bell. Without his invention, the world would not be able to communicate on the telephone. The discovery of the phone would slowly go on to become the phone we know today, and it has been a vital method of communication for everyone. An individual may call another figure for a variety of reasons, and some call another one if he or she is in desperate need of something, and others may call another person purely based on curiosity or interest. One way or the other, the telephone has been such a significant part of communication.

In conclusion, the rise of technological devices has seen an increase in a lot of people being involved in a particular electronic device. More and more people own gadgets, and more and more people communicate by using the properties that they own. Therefore, it has been stated that technology has massively impacted the way people interact not only because of the impact of the new social media apps for people to communicate but also the way people use cell phones to communicate with each other.

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What would life be without modern technology?

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In modern society, communicating with people has been more accessible than ever. Individuals use their phones or their computers to interact with one and another and use their electronic devices however they wish. A world without modern-day technology is so unheard of as technology has become a crucial factor in our lives. Ranging from the poorest people in the world to CEO and founders of multinational corporations, everyone has an electronic gadget. The past 20 years have seen the most considerable improvement of technology the world has ever seen. The smartphone was released only in 2008 and had changed the world ever since. It is no secret that as technology improved throughout the years, many people's lives are shaped by electronic devices. However, people do not necessarily think about a world in which people have no access to modern technology and are stuck with the ancient tools that humans had in the past. A world in which technology is not present can come with benefits and drawbacks.

Starting with the positives, a world where people have no access to modern-day gadgets would be simple in the way that individuals do not have to worry about trivial things. Individuals would not need to worry about fame and influence they have over certain people. In modern-day society, smartphones and the internet is replacing face-to-face conversation, and more people are starting to message people for hours instead of meeting the person in real life. When a

conversation in real life could be ended in minutes, a lot of people tend to carry out test messages for hours and hours and achieving nothing. For example, a lot of people seek to stare at their smartphones in a restaurant or a public area while hangout with their loved ones. These people are essentially choosing the company of technology over companionship from friends or family members. If technology is not present, society itself would appreciate life itself and would not worry about fame or influence.

A world without technology would also come with repercussions. As human beings evolve, we take many things for granted. Cars and computers that people use on a daily basis are only present due to technology. Computers would not have been invented, and people, in general, would become more lethargic and unsocial. This is because communication would not be available, and interaction between others that one has never seen would never work in a world where technology is not adjacent. If the 21st century did not have access to technology, life would be a disaster to put it simply. People would be unable to travel around



the world as airplanes would be just a fanciful dream. Also, the chronics would be unable to live for a duration of time as medical assistance would be unavailable.

In conclusion, the rise of technological devices has seen an increase in a lot of people being involved in a particular electronic device. A world without modern-day technology is so unheard of as technology has become a crucial factor in our lives. Also, it is a commonly accepted fact that technology tailored the way humans live. Life would be extremely altered without technology. It is pretty clear that the world would go crazy if technology did not exist. While this invention significantly has its drawbacks, the benefits significantly outweigh the demerits.

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Segway Mishap: Is Technology Ever Perfect?

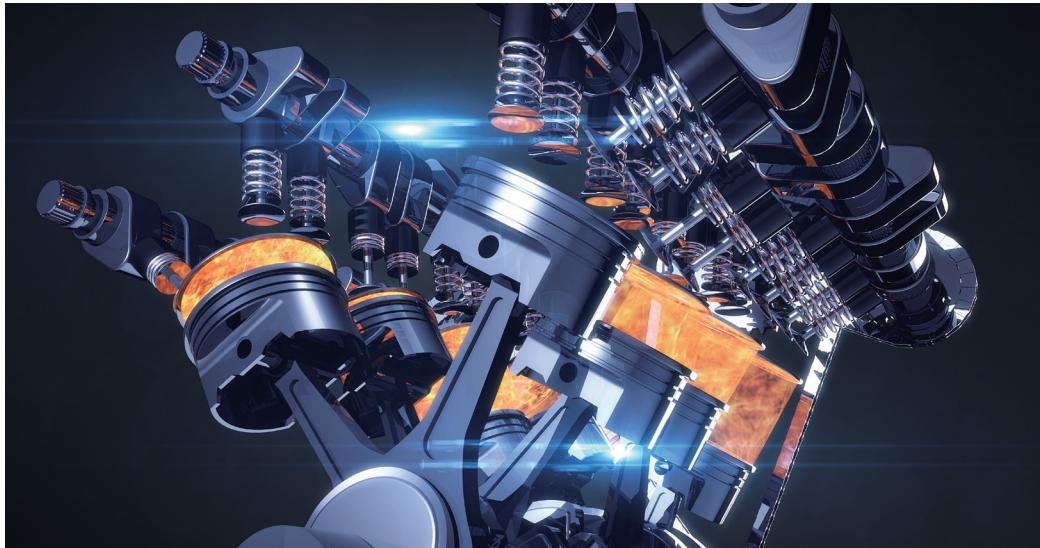
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Segway first revealed their S-Pod, a self-balancing wheelchair, with a sleek white body and oval shape, at an annual CES tech show that was held from January 6th to 9th, 2020. The S-Pod was inspired by the gyrospheres from the cinematic movie Jurassic World, at 60 inches in height and 330 pounds in weight. The S-Pod

can carry up to 264 pounds, and was designed to replace bulky golf carts and heavy motorized wheelchairs as a smoother ride. However, Segway has a long history of crashes at their annual tech show, and this year was no different. While the model was being tested by attendees at the reveal, one of the test drivers, journalist Mark





Matousek of Business Insider, was unable to control the speed of the S-Pod and crashed into a wall. Nobody was injured by the crash, but the crash rendered the model unavailable for further use.

Because of the crash, some have begun to doubt whether the vehicle should be released to the public at this stage of development. Because the vehicle was initially designed to transport people through tight spaces, the sensitivity of the controller may, on one hand, be beneficial while on the other hand cause difficulties and

accidents like this one. The fact that riders must wear a helmet before getting on the vehicle itself is a sign that the S-Pod may not be as safe as it claims to be, and perhaps also a sign that the vehicle must be further developed before release.

Matousek reported that the joystick that controlled the S-Pod was very sensitive, and it was difficult to control the speed of the vehicle as Matousek found himself accelerating faster than he wanted on several occasions. The steering of the S-Pod was reportedly very difficult and not very intuitive, as



it differs from other Segways in terms of how to control the direction it goes in and how fast it moves.

This mishap may shed light on the fact that technology can never be perfect as long as humans invent it. There is always something that could go wrong, or something that humans may find difficult to handle. Although robots, machines, and other types of technology can be much more precise and quicker than humans, there could always be a flaw in their code or system, as many specialists program machinery with over 1 million lines of code in which one small mistake could lead to a bug that only happens once in a blue moon. The machinery

could also have turned out differently than originally planned, or the original plan could have been less solid than the makers had in mind. Granted, technology has developed exponentially over the last 50 years, making people's lives so much easier with comfort, technology, and access to the world's knowledge, but it can never be perfect because the people making it aren't perfect either.

Some may say that because technology has developed so much and there has been so much research done in specific areas, we should be able to prevent these kinds of coding accidents or design mishaps. However, nothing is ever perfect, no matter how developed and constantly perfected today's technology may seem. And Segway's latest model had proven just that.

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History of Technology

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The term technology, a combination of the Greek *technē*, “art, craft,” with *logos*, “word, speech,” meant a discourse on the arts, both fine and applied. When it first appeared in English in the 17th century, it was used to mean a discussion of the applied arts only. However, by the early 20th century, the term embraced a growing range of means, processes, and ideas in addition to tools and machinery. These days, technology affects every aspect of our lives, whether it is major or minor. How did technology become such a major influence?

Even though technology may only seem like a term that describes the developed machinery in the modern world, technology also refers to the tools and gadgets that animals used. The Stone Age was a major turning point of the use of technology as both primates and humans used sticks and stones as tools to solve problems. By 70,000 BCE, the Neanderthals developed more advanced tools that assembled the modern-day head and haft. Towards the end of the last ice age, approximately 15,000 to 20,000 years ago, few communities that were favored by the geography and climate moved into a new period: New Stone Age, which eventually led to a marked rise in population, size of communities, and the beginning of town life. Soon, many other communities and civilizations utilized tools and technology. Many countries industrialized and started to resemble the world we are currently living in. One of the most major methods of connecting people all around the world, the World Wide Web was invented in 1989 by Tim Berners-Lee, an English scientist. This new and innovative online platform was

released in 1991 and has since become the most widely used online platform.

Technology has been rapidly improving since and has gone through the invention of mobile phones, robots, and self-driving cars. It has improved the overall quality of life for a lot of individuals and communities all around the world. Unfortunately, it has also brought many negative effects that have harmed many people, including young adolescents. If technology is used in the correct method, the world can improve even more and can technology can become a beneficial influence to everyone who uses it.

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04

SPACE

- OSIRIS-REx And Its Effect On Space Research



OSIRIS-REx And Its Effect On Space Research

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In 1999, LINEAR (Lincoln Near-Earth Asteroid Research), discovered the asteroid “Bennu,” or 101955 Bennu. It was named by a 9-year-old, Micheal Puzio, for the boy won a contest that allowed him to name it. Bennu comes in near contact with the Earth every six years, as NASA has proved that Bennu has a 1 in 2,700 chance of striking our planet in the late 22nd century. However, other researchers claim that Bennu may burn up in the Sun’s heat, or also come in contact with Venus. Throughout 101955 Bennu’s long journey to get to Earth, it has ended up near earth due to the gravitational interactions with giant planets and the gentle push of heating from the Sun. The OSIRIS-REx project created by NASA was a spacecraft that was built for it to land on the asteroid and obtain rock samples by drilling and gathering minerals from the surface of the asteroid. The samples will then be sent through a small container shot out of the spacecraft back to the Earth. This project has officially started, as the spacecraft has been launched to outer space. NASA is assured that Bennu’s rock samples will get sent to Earth by 2023. Technology like such is important and valuable for our study on outer space, as more dangerous asteroids are coming towards Earth, and many of them have the potential of producing global damage to the Earth.

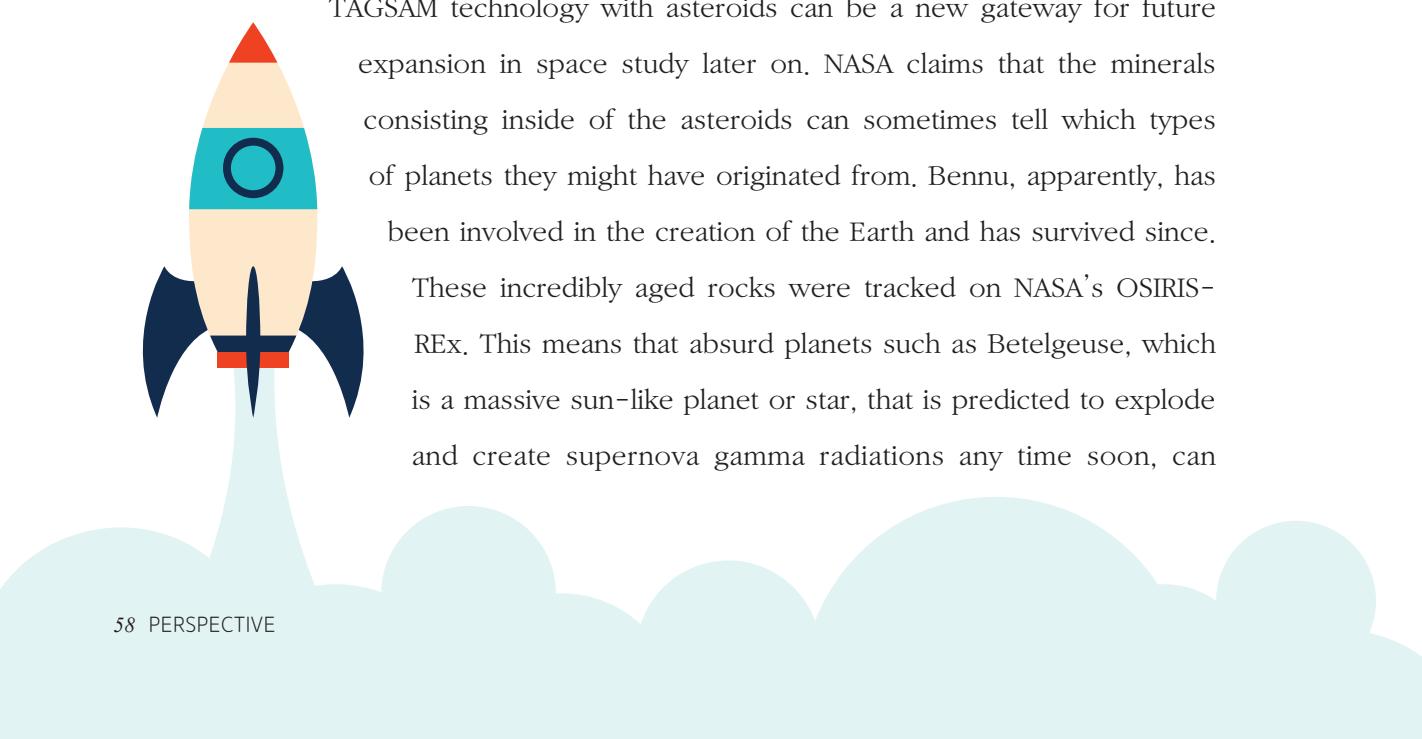
As the OSIRIS project was beginning to map out, the public questioned

its mechanics and how the spacecraft was going to successfully collect and send back samples of rocks on Bennu. According to NASA, there are four main compartments to this spacecraft. The launch container, sample return capsule, the sep and spin mechanism, and the TAGSAM arm. The launch container consists of the booster that is meant to send the sample return capsule back to Earth with all the rocks inside, and the sep and spin mechanism works alongside the TAGSAM arm to gather and garner the sample rocks. As the sep and spin mechanism pecks away at the surface of the asteroid, the rocks that are chipped outflow through the TAGSAM, to go right into the container (sample return capsule). The fascinating and quite new technology of TAGSAM, the Touch-And-Go-Sample Acquisition Mechanism is planning to help NASA progress in their outer space research and expansion. The TAGSAM arm used in the OSIRIS-REx, according to NASA, uses “high-pressure nitrogen to kick up regolith material to be captured within the sampler head plus fine-grained material collected via contact pads. Up to three sample collection maneuvers are possible to ensure sufficient sample mass enters the mechanism.” This means that the OSIRIS-REx uses high-pressure nitrogen and gasses to assist the collecting of the materials on Bennu. This type of Touch-And-Go technology will be very effective in future research, as it is incredibly efficient and accurate.

Along with the TAGSAM technology and OSIRIS-REx, NASA can predict and prevent dangerous asteroid hits and effects. According to NASA, 11 potentially dangerous asteroids are coming towards Earth and have passed by Earth as shown from a report on February 20th, 2020. NASA has made plans for using the same Touch-And-Go technology to gather samples to prevent potential impacts

from dangerous and stammering asteroids that have the potential of global impact. The Earth has experienced possible occurrences of extinction and has also experienced the extinction of nature and living creatures from a long ago. These types of asteroid collisions can occur anytime soon, and thanks to NASA and the new Touch-And-Go system, we can learn more about asteroids and their compositions, to hopefully prevent impact. According to NASA, On April 13, 2029, a deadly asteroid named Apophis will pass Earth closer than geosynchronous communication satellites but will come no closer than 31,200 kilometers (19,400 mi) above Earth's surface. However, NASA expects a 5% chance that this asteroid with potential global impact may land a crash at our planet's surface. NASA, discovering the TAGSAM technology with the OSIRIS-REx, plans to use this type of design again to collect samples on Apophis. Although other natural causes such as global warming are believed to be the cause of the Earth's extinction, an asteroid impact is also incredibly probable. Therefore, the technology and techniques founded and adapted by NASA can help prevent major hazards from space.

According to NASA, their OSIRIS-REx technology was able to track the age, composition, and types of rocks that were inside Bennu. This means that NASA's

A stylized illustration of a rocket launching. The rocket has a white body with a blue band around the middle. It features a red and white striped fin at the top and a black and white striped fin at the bottom. A plume of white smoke or fire is visible at the base. The background consists of light blue, rounded shapes resembling clouds.

TAGSAM technology with asteroids can be a new gateway for future expansion in space study later on. NASA claims that the minerals consisting inside of the asteroids can sometimes tell which types of planets they might have originated from. Bennu, apparently, has been involved in the creation of the Earth and has survived since.

These incredibly aged rocks were tracked on NASA's OSIRIS-REx. This means that absurd planets such as Betelgeuse, which is a massive sun-like planet or star, that is predicted to explode and create supernova gamma radiations any time soon, can

now be researched by experimenting with asteroids. The asteroid samples NASA can collect with the Touch-And-Go technology can hopefully help keep the Earth safe from other outer space hazards.

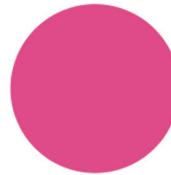
Therefore, along with NASA and their TAGSAM technology as such used in the OSIRIS-REx, space exploring and studying became so much more convenient and easy, helping NASA protect the Earth. Bennu plans to miss the Earth, but this doesn't seem to be the end of these destructive asteroids. NASA is trying their hardest to create more efficient TAGSAM models to gather samples and research.

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05

RELIGION

- Religion is at the Core of the Rapidly Spreading Contagion in South Korea



Religion is at the Core of the Rapidly Spreading Contagion in South Korea

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The largest number of Covid-19 infections outside of China is now in Korea. Health officials there have confirmed more than 1,000 cases and the virus has so far killed 11 people. About half those cases are linked to the Shincheonji Church of Jesus, a group the government describes as a cult, prompting officials to test all 200,000 of its followers. Authorities linked another cluster of cases to a church in the southern city of Busan, and yet another to a group of Catholic pilgrims returning from Israel. The virus also infected a number of people at the Myeongseong megachurch in Seoul, which has 80,000 congregants.

In response, the Catholic Church today suspended all masses in Korea. Buddhist temples and Protestant churches around the country have also suspended religious gatherings. Shincheonji halted its services too. The moves to limit religious activity in Korea are by no means specific to Korea—churches and temples in Singapore and Hong Kong have made similar decisions. But organized religion has played a far bigger role in the spread of Covid-19 in Korea. Explaining the linkages between religion and the outbreak in Korea, Francis Jae-ryong Song, a professor in sociology at Kyung Hee University in Seoul, described the country as a “zealous Christian state.” He said many Korean Christians have an “evangelical mindset” and their religious activities, like attending worship sessions and outreach multiple times a week, and their unwillingness to curb those activities, may have led to the large-scale spread of the contagion.

About 30% of Korea's 50 million people identify as Christian, according to some estimates. The church is also politically active in Korea and exerts a powerful influence on government policy. The impact of Korean evangelicals is also felt strongly abroad: The country sends the second-largest number of missionaries overseas. In the context of the coronavirus, that religious fervor in Korea has played a role. A former member of Shincheonji told the New York Times that members were told not to be afraid of sickness and focus only on converting more followers. Now, as the virus tears through the Shincheonji community, the municipal government in Seoul has banned all of the sect's gatherings in the capital.

Even as the virus spreads, and after the Korean government advised the public against mass gatherings, some have continued to attend church, and not all churches in Korea have canceled services. Paul Cha, an expert on Korean history and religion at the University of Hong Kong, emphasized the importance of church-going as a ritual for many Korean Christians. "It constitutes an important part of your faith and devotion. Unless you're really sick on your death bed...you go to church," he said. He added, however, that Koreans may also be more likely to continue going to group activities as they do not have the "social memory" of living through SARS as people in Hong Kong did in 2003.

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