

# Barun ICT **7&8** July & August newsletter **ENG**

Barun ICT Research Center conducts research on various ICT issues to explore socially desirable solutions.  
Barun ICT Research Center aims to contribute to healthy and ethical ICT society.

## BARUN ICT Events

### SK Telecom Happy Community Project (*ICT Care Service for the Elderly who Live Alone*) Barun ICT Research Center of Yonsei University Agrees to Analyze Effects of the Project




Programs to support those in socially vulnerable positions such as the disabled or the elderly, through providing intelligent information technology such as AI speakers or IoT, is increasing. SKT, KT, and LG U+’s endeavors stand out in Korea, and SKT’s ICT care service for the elderly who live alone is now in full swing after the launching of the Happy Community Project on April 4th. This project installs infrastructure, including AI speakers, for the elderly and provides customized education

for practical use, in an attempt to help reduce their loneliness and solitude. Currently, the project has reached out to over a thousand households in Gangnam-gu, Seongdong-gu, Yangcheon-gu, Yeongdeungpo-gu in Seoul, and Seo-gu in Daejeon, and SKT will cooperate with organizations in eight regions to provide the service to 2,100 more homes.

At the 32nd Information Culture Month celebration, held at Gwacheon National Science Museum on June 14th, SK Telecom received a Commendation of Information Cultural Merit from the Minister of Science and ICT for its AI Care Service, which is also a part of the Happy Community Project. Junho Lee, SKT’s Social Value Pursuit team leader, shared: “This commendation is the result of SKT’s efforts to create social value by openly sharing SKT’s innovative ICT.”



Will ICT be shown to help improve their psychological well-being? Barun ICT Research Center of Yonsei University is in charge of testing the effectiveness of this project based on the research objectivity as an outside party. More specifically, the results of three surveys during the project will be analyzed to look at the information gap between senior citizens, their psychological well-being in terms of happiness, feelings of sadness, and solitude, and the senior citizens’ change in attitude towards digital devices. 

## APEC, CBPRs (Cross-Border Privacy Rules) Workshop

**Beomsoo KIM**

**Executive Director, Barun ICT Research Center, Yonsei University**



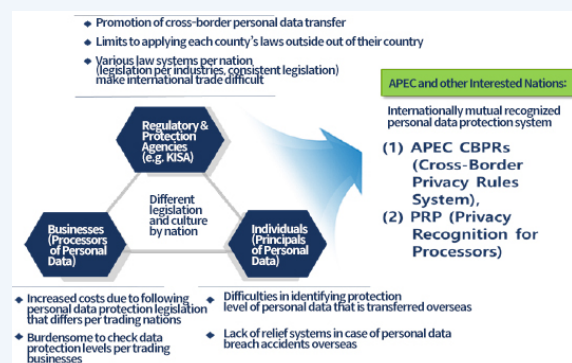
Director Beomsoo Kim of Barun ICT explains how the Republic of Korea has prepared for CBPRs and the potential participation of KISA as an establishment responsible for certification and its preparation procedures.

replace existing laws. In other words, it does not ask for a revision of existing laws of each nation and the nations and businesses that process private cross-border data may voluntarily decide whether to participate or not. They also may add extra items to the fifty certification articles that are provided by the CBPR system, and this certification does not replace the requirements of respective nations' laws or policies. The CBPR system is a voluntary data protection system that counts the ties between administrative bodies in charge of data protection to obtain data protection effectiveness and the effective damage relief that results from the relations as its main strengths.

At the workshop, representatives from APEC's major nations discussed the role of Accountability Agents and the continuous expansion measures of relevant systems, including CBPR systems that can protect private data effectively without obstructing its flow in moving rapidly across borders. The representatives of Asia-Pacific nations that attended the workshops, despite their respective data protection culture and systems, agreed upon the importance of finding a compromise in carrying out the CBPR system for more effective personal data protection.

Director Beomsoo Kim of Barun ICT Research Center, Yonsei University, expressed his gratitude towards privacy experts, such as Josh Harris, and leading member nations for their participation in the planning of the APEC CBRP system for the past 10 years. He also predicted that, unlike the concerns presented recently by the OECD and ICDPPC, the system would continue to develop in the future based on the keen interest from the participants of the workshop and the accumulated experience of participating nations. Through a presentation of Korea's data protection certification cases, he mentioned that over a thousand certification evaluators were needed to run personal data protection certification systems such as PIMS (2011 ~ 2018) and its successor ISMS-P(2019~ present). Director Kim emphasized that to systematically manage certification levels, securing a certain number of evaluators along with a sophistication of the certification system through systematic education and management is essential. Director Kim will continue to spearhead international cooperation for personal data protection through the Asia Privacy Bridge Forum and other activities. 🌐

The Asia-Pacific Economic Cooperation (APEC) hosted an international workshop for the discussion of Cross-Border Privacy Rules at the East-West Center at the University of Hawaii for two days, starting June 18th. The Cross-Border Privacy Rules (CBPR), which took off at APEC in 2011, is voluntary, non-binding, flexible, and does not



Cross-border personal data transfer and international personal data protection certification system

## Barun ICT Research Center of Yonsei University Receives the 2019 Minister's Commendation of Information Cultural Merit

At the 32nd Information Culture Month celebration, held at Gwacheon National Science Museum on June 14th, Barun ICT Research Center of Yonsei University was awarded the 2019 Minister's Commendation of Information Cultural Merit. This is awarded to individuals or organizations that contributed to fighting against the adverse effects of ICT, such as reducing the bridging digital divide, fostering a sound information culture, and preventing and reducing overreliance on smartphones and the internet. Barun ICT's efforts to solve these problems and spread a sound and safety information was recognized.

Barun ICT Research Center of Yonsei University was established with the support of SK Telecom, after recognizing the need for a world-class research center that could help construct an ethical ICT culture. Currently, the research center has teamed up with university research teams and experts from the business and public sector to conduct extensive studies to create a happier and more connected life with information technology. Barun ICT, which celebrated its fourth anniversary this year, is making efforts to spread and share the research results that have accumulated through the publishing of smartphone usage behavior reports, factual surveys on child smartphone usage, and factual surveys on digital media usage. Moreover, Barun ICT has hosted expert discussions on the prevention of child digital overdependence to establish it as a social agenda, and the center has since assumed a leading role in developing and guiding ongoing policy discourse. Furthermore, it has been hosting the Asia Privacy Bridge Forum biannually, to promote an organic international response to the issues regarding personal data protection and has established MOUs with relevant organizations from both Korea and overseas to coordinate diverse research cooperation. 🌐



## 7th Barun ICT Essay Contest



On June 10th, Barun ICT Research Center of Yonsei University hosted the 7th Barun ICT Essay Contest. A total of 31 essays on the theme of "Problems and Tasks facing our society in the 4th industrial revolution" were submitted, and four winners were selected following rigorous evaluation. Director Beomsoo Kim of Barun ICT Research Center, and Professors Tae-hee Lee and Linda Kilpatrick Lee were present at the awards ceremony; the four best will be published in the Barun ICT newsletters. They are:

- <The Fourth 'Inequality' Revolution> **Joo Seung LEE** Department of the English Language and Literature
- <Digital Distraction: The New Normal> **Seung-eun LEE** College of Sciences in Education / Department of Education
- <Destroyed Trust by the Boost of AI> **Boo Yong LEE** Department of the English Language and Literature
- <The Race Against a Jobless Society> **Hocquard Nicolas** School Of Business / Department Of Business Administration

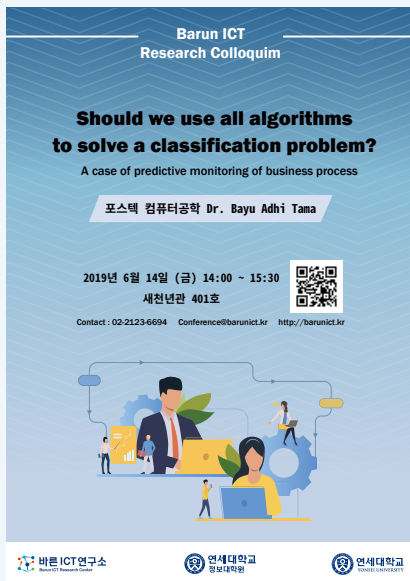


# BARUN ICT Research Colloquium

## Which Algorithm Do You Use for Data Analysis?

**Dr. Bayu Adhi TAMA**

Pohang University of Science and Technology



If businesses could predict events or accidents that could occur in the assembly line or during the work process, decision-makers could deal with the issue or create a solution beforehand. To do so, among the algorithms that have been suggested so far, which one would produce optimum results?

On June 14th, Barun ICT Research Center of Yonsei University invited Dr. Bayu Adhi Tama of Pohang University of Science and Technology to host a seminar on a comparative analysis of the efficiency of prediction algorithms dealing with business process event logs, titled "Should we use all algorithms to solve a classification problem?" Predictive analytics is an essential function of Business Process Management (BPM) which predicts a business process's future state and performance. Through benchmarking analysis done by applying the 20 classification techniques to six event logs (the ticketing management process of a help desk at an Italian software company, the loan application form of a Dutch financial firm, an incident management log of Volvo IT Belgium, events of sepsis cases from a hospital, road traffic fine management, hospital billing), this study sought to identify which algorithm showed the best performance. More specifically, the classification techniques that generally showed proficient performance in each event logs were identified. Next, the study sought to observe the influence of event log features such as variability on the selection of the classification technique that demonstrated the best performance. The analysis confirmed that the credal decision tree (C-DT) was best at predicting what was to come next. The results of this study are restricted to just six event logs, but when future algorithms that analyze consumer behavior become more complicated with the accumulation of Big Data, it could help reduce the social cost of unforeseen accidents. 🤖

Summarized by **Miyea KIM** Research Professor at Barun ICT Research Center, Yonsei University

## Aggressive Behavior and Negative Emotion Triggered by Adolescent's Use of Social Media

Jaeyoung PARK, Chihun HAN, Joohyun OH (2019, Forthcoming)  
The Effect of Digital Technologies on Adolescent Mental Health: The Role of Parenting Style and Peer Attachment

**Jaeyoung PARK, Chihun HAN, Joohyun OH**

Graduate School of Information, Yonsei University, Barun ICT Research Center

The proliferation of digital technology through the internet has brought multiple changes to our society. Obtaining information, relieving stress, and forming diverse relationships are a few of the positives of the internet, but there are concerns regarding the possible adverse effects that internet use can have on the mental health of adolescents. According to youth counseling & welfare centers in Korea, cases of teenage mental health counseling have doubled from 25,000 in 2013 to around 50,000 in 2016. This steep rise suggests that Internet usage is one of the main issues behind mental health issues among adolescents.



This study observes how adolescent computer and internet usage behavior affects various forms of mental health (distractedness, aggression, depression), along with how parents' affection and relationships with friends influence the adolescent's mental health. According to a longitudinal analysis using Korean Children & Adolescent panel data of 7th graders provided by the National Youth Policy Institute, adolescents showed positive effects such as a reduction in distractedness and depression when they used computers and the internet for educational purposes. Consequently, it is possible to infer that using computers and the internet for educational purposes will increase adolescents' sense of educational achievements or satisfaction, which then leads to a reduction in depression. Notably, the positive effects of the educational use of technology were stronger among adolescents who felt like they did not receive enough affection from their parents. This finding suggests that parents who do not have the time to show enough love and attention to their children can offer an educational environment based on computers and the internet to support their children's mental health and educational achievements.

However, the negative aspects of computers and the internet is also evident. Distractedness and aggression appeared to increase with more computer gaming, while aggression and depression also increased with more social media usage. When using social networking services such as Facebook and Instagram, users tended to compare themselves with others. There is a possibility that repeatedly comparing oneself to others who appear to have a better position in life can lead to feeling negative emotions and ultimately becoming depressed. Moreover, on social networking services where one's ideas are expressed, such as Twitter, there's a higher chance of getting caught up in an argument with another user. Therefore, the more one uses SNS sites like Twitter where ideas are frequently expressed, the stronger the tendency for aggression. Today's society requires the knowledge of a right and ethical use of social media. In other words, instead of merely restricting usage time, adolescents need to be taught to refrain from comparing themselves with others and also to not react with hostility to other people's online opinions.

Meanwhile, adolescents whose parents frequently expressed affection and those who had amicable relationships with friends were less influenced by social media's negative impact to increase depression. Conversely, this suggests that adolescents who found their parent's affection to be insufficient were more heavily impacted, and their grief showed a steeper increase. Adolescents who crave love may resort to interaction with others on social media to solve this problem. However, this study suggests that adolescents who do not receive much affection are more likely to become depressed as they use social media than adolescents who receive adequate amounts of love from parents. Social media could potentially turn into a poison that could hurt the user's mental health in the case of these adolescents deprived of affection. 🧩

## “Wheeling”: “Healing” in Transportation for the Mobility Impaired?

Ji Su KIM

CTM, Techno-Art Division, UIC, Yonsei University

Student  
start-up  
project



In March 2019 three university students gathered at Barun ICT Research Center. Despite coming from very different backgrounds, they all shared the same goal of trying to improve society through ICT. Thus began the Wheeling project, an app that suggests custom-made travel destinations while also offering those with mobility impairments an integrated tour guide service.

Wheeling, a portmanteau combining the words wheelchair and healing, intends to ensure the right to travel independently for those who may find it challenging to move around freely. One of the members of the Wheeling Project came up with the idea after going on a trip overseas with a cousin who is disabled, where difficulties arose due to the lack of information on barrier-free travel destinations. According to Ha Yeon Kim, one of the project members, there are barrier-free tour guides, taxi services for the disabled, and transportation information for those who experience hardship using public transportation. However, there is a distinct lack of services that provide these pieces of information all at once. The Wheeling project targets enhancing mobility, assuring the right to travel independently for all and promoting social participation in the short term, while their long term goals are to raise awareness on barrier-free traveling and expanding transportation facilities for the mobility impaired.

Using the Wheeling app is simple. First, the user enters their data into the app, after which a user-level is calculated depending on the data such as age or average mobility. Then, the user selects a destination and the routes to getting there. Based on the chosen destination and the characteristics of the course, a tour-level is measured, which will let the user know how easy or difficult it is to get there. Based on the estimated user and tour-level, the app enables the user to know how adequate this travel option is five different levels, from “very easy” to “very hard.” If the tour is deemed too demanding, it can even suggest an adequate alternative nearby.

Currently, businesses such as BF.ZIDO and Amuse Travel offer barrier-free travel packages, but social awareness of barrier-free traveling remains underdeveloped, which is why there is a need for market testing. Even so, the Wheeling project is exciting in that it could become the focal point of barrier-free traveling for not just the disabled, but other mobility-impaired travelers such as the elderly or pregnant women. Wheeling remains in its beta test phase, which means that it will likely be released after the coming year, but much is expected from the Wheeling Project to show how ICT may help those in need. 🌈



## From Cradle to Grave, Healthy Media Habits for Children

[SKT Insight SKT5GX ICT Column] 19.06.19

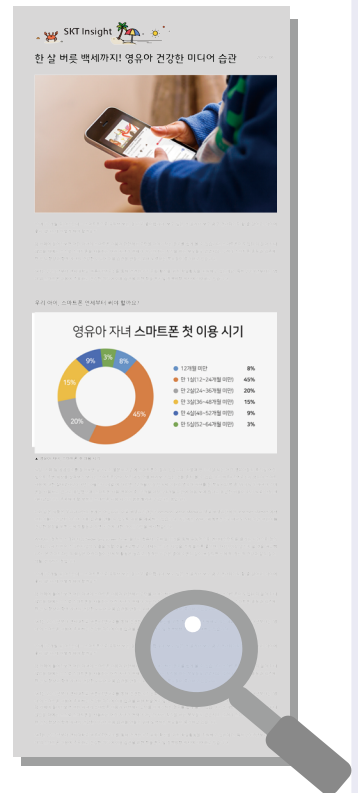
"She's just 17 months old, but she already loves to watch YouTube on smartphones. I hear smartphones are bad for children, what should I do?" says women on an internet café for mothers. It's easy to see smartphones in the hands of children in public places such as restaurants and cafes, but should we continue to let them use the devices?

According to the "Factual survey on children's smartphone use" carried out by Barun ICT Research Center of Yonsei University, 45% of children first used a smartphone when they were 12 ~ 24 months old. This data means that many children are exposed to smartphones even before they reach their second birthday, making it essential to look at how parents can nurture healthy media habits in their children.

The World Health Organization defines the time spent enjoying passive entertainment such as TVs, computers, and other mobile devices as sedentary screen time. They advise parents to keep children younger than two away from exposure to such passive entertainment and children of two to four years to be limited to no more than an hour of sedentary screen time per day. Due to the usefulness of smartphones, it's difficult even for adults to avoid using them.

So what would be a suitable way for children to use them? One option would be to expose smartphones to children as not just a device for watching videos on YouTube or playing videogames, but as a means of finding essential information and providing conversation topics that may be used later with their parents. For instance, parents could talk to children about finding out the air quality levels before leaving home, or they could look up recipes on their smartphones to cook together. In particular, it is imperative that parents make an effort to demonstrate a healthy media habit, such as putting down the smartphone after looking for useful information and creating an environment where children can observe and follow their parents' actions. 🧑🏫👤

Source: <https://www.sktinsight.com/116419>



## Barun ICT Research Center of Yonsei University awarded the 2019 Minister's Commendation of Information Cultural Merit

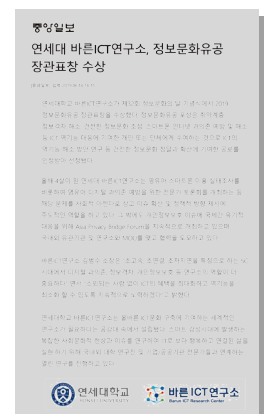
[JoongAng Daily] 19.06.14

At the 32nd celebration of Information Culture month, Barun ICT Research Center of Yonsei University received the 2019 Minister's Commendation of Information Cultural Merit. This is awarded to individuals or organizations that contributed towards countering the adverse effects of ICT, such as bridging digital divide in the lower levels of society, fostering a sound information culture, and preventing and reducing overreliance on smartphones and the internet. Barun ICT's efforts to solve these problems and spread a healthy information culture throughout society was recognized.

Barun ICT Research Center was established under a consensus recognizing the need for a world-class research center that could contribute to the construction of an ethical ICT culture. Since its establishment, Barun ICT has dealt with themes such as the prevention of children's over-reliance on digital devices, personal data protection, and the information gap. Currently, the Center is working with university research teams and experts from businesses and the public domain to create a happier and connected life with IT.

Upon receiving the award, Barun ICT Executive Director Beomsoo Kim stated: "In the 5G era, known for its hyperspeed, hyperconnectivity, and ultra-low latency, the role of the research center in studying the digital over-reliance and the information gap, personal data protection has become immensely important." He added, "Barun ICT will continue making efforts to maximize the benefits of ICT, while minimizing its adverse effects, to ensure that nobody is left out in our society." 🧑🏫👤

Source: <https://news.joins.com/article/23497027>



# Is Gaming Addiction Really a Disease?

Ji Su KIM

CTM, Techno-Art Division, UIC, Yonsei University



On May 28th, an announcement from the World Health Organization rocked the gaming industry. At the 72nd World Health Assembly, held in Geneva Switzerland, the issue of classifying gaming disorders as an official medical condition was finally passed. Technically, gaming disorder falls under the category of mental, behavioral, and neurodevelopmental disorders while symptoms include losing control over gaming, prioritizing gaming over other daily activities, and if these conditions continue for over 12 months despite repeated adverse results [1]. In Korea, Statistics Korea (KOSTAT) updates the Korean Standard Classification of Diseases (KCD) every five years, so the actual implementation of this decision will most likely be after 2025.

The aftermath of this decision was notable. Several discussions have appeared as a result, such as whether professional gamers, who spend a large portion of their daily lives playing games, should be considered addicts. Within Korea, a large number of different opinions were expressed on the issue. Dr. YoungChul Jung of the Department of Psychiatry at Severance Hospital, Yonsei University, stated that the focus of gaming addiction disorder had to do with gamers stubbornly choosing to play a single game strategy to enjoy its uncertainty, rather than enjoying the games themselves. From this perspective, as professional gamers play the games more creatively than other gamers, Dr. Jung says that professional gamers should not be regarded as addicts [2].

When asked whether eSports players should be considered addicts, the WHO replied that they were

not and, more specifically, they explained that gaming disorder referred to cases where excess gaming led to significant damage in individual, social, educational, or vocational capacities. However, SangHyeok Im, the president of Korean Game Law and Policy Society, raised his doubts on the effectiveness of the decision as the decision relied upon an index that measured internet rather than gaming addiction [3].

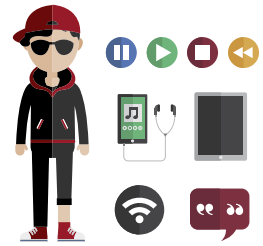
Despite the numerous controversies, the WHO's decision to adopt gaming addiction as an official illness does not necessarily view gaming itself as a harmful influence on society. The correct stance would be to locate the focus of the decision on, not games themselves, but on the addiction to gaming. Gaming addiction has indeed led to crimes and other social issues, which highlights the need for adequate management of gaming addiction. However, for the sake of identifying causality, whether gaming itself causes mental illnesses or leads gamers to become excessively in their gameplay, or whether a gamer's mental state and their environments interact to produce a form of gaming addiction needs to be correctly classified [3]. Gaming has taken root as a form of culture in today's world, but a healthy gaming culture will appear only when gaming addiction is clearly understood. 🎮

Source: [1] Baik, J. (2019, May 29). WHO confirms gaming addiction as a disease. Retrieved from [m.news.zum.com/articles/52767341](https://m.news.zum.com/articles/52767341)  
[2] Park, M. (2019, May 28). WHO's response upon being asked whether pro gamers should be considered gaming addicts. Retrieved from [news.joins.com/article/23481183](https://news.joins.com/article/23481183)  
[3] Kang, E. (2019, May 28). It's not the games, stupid! Retrieved from [news1.kr/articles/?3631748](https://news1.kr/articles/?3631748)

# YouTube; Where Do We Draw the Line for Minors?

Yu Jin NA

Korean Language and Literature, Yonsei University




YouTube banned children under the age of 14 from live-streaming by themselves [1]. They announced the decision to ban children from live-streaming unaccompanied by an adult on its official global and Korean blog in July. Moreover, the streaming service has implemented a machine learning tool that can recognize such content to find and delete them. Minors can appear by themselves on pre-recorded materials, but even in this case, the comment section will be disabled [2].

Such actions from YouTube seem to have been influenced by the repeated insistence to protect children and teenagers from the limitless amount of content available on the site. A study has shown that YouTube's recommendation algorithm may lead to pedophilic crimes, which would undoubtedly support the repeated requests to protect minors. According to this study, when pedophiles watch videos containing sexual content, YouTube recommends videos where children are wearing less, such as swimming or doing gymnastics [3].

Teenagers may also be adversely affected by YouTube. According to WiseApp, a business that analyzes applications for market data and user behavior, YouTube boasted the longest usage time across all age groups from teenagers to users in their 50s, with teenagers having recorded a total of 8.6 billion minutes [4]. Due to the prolonged time, there are concerns that teenagers will encounter unfiltered hate content.

Despite these concerns, many believe YouTube's new

measures to be inadequate in ensuring children's safety. Although the machine learning tool was implemented to identify the age of individuals in the video, it is expected to face problems in terms of accuracy. Last March, the webtoon author Ju Ho-Min, who is bald, was identified as a minor and the comments section of his videos was disabled.

YouTube is an enormous platform[5] that currently has 1.9 billion users worldwide and 31 million users in Korea, making it extremely difficult to individually manage the content or viewing environment of every viewer or uploader. Subsequently, in addition to YouTube's internal rules, a social compromise must be reached, and an adequate environment needs to be built to cope with the changes of ICT. Schools should educate children on YouTube and other social media usage ethics, while laws regarding children's usage of ICT contents could also be an option. 

Source: [1] Shin, D. (2019, June 10). YouTube bans minors under 14 from live-streaming by themselves. Retrieved from [www.hani.co.kr/arti/economy/it/897250.html](http://www.hani.co.kr/arti/economy/it/897250.html)

[2] Park, S. (2019, June 10). YouTube under 14 can't livestream alone. Retrieved from [biz.heraldcorp.com/view.php?ud=20190610000213](http://biz.heraldcorp.com/view.php?ud=20190610000213)

[3] Kim, J. (2019, June 7). YouTube recommendation algorithm may help pedophiles. Retrieved from [www.koreatimes.com/article/1251509](http://www.koreatimes.com/article/1251509)

[4] Na, J. (2019, March 02). YouTube plastic surgery ads lure teenagers in, while regulations remain lax and side-effects are ignored. Retrieved from [news.v.daum.net/v/20190302100233893?f=m](http://news.v.daum.net/v/20190302100233893?f=m)

[5] Yoon, H. (2019, April 15). Financial sector fascinated by YouTube, Industries now showing distinct promotion strategies. Retrieved from [www.enewstoday.co.kr/news/articleView.html?idxno=1291398](http://www.enewstoday.co.kr/news/articleView.html?idxno=1291398)

## 3D Printing in Construction

Sang Hyun KIM

Architecture, Yonsei University



3D printers are devices that “print” three-dimensional objects based on three-dimensional blueprints, and 3D printing refers to the process in which materials in a string, liquid, or powder form are successively added to create a three-dimensional solid object. Lauded as one of the core technologies that is leading the fourth industrial revolution, 3D printing is currently being used across many different fields [1]. In its early stages in the 1980s, 3D printing was considered one of the most innovative technologies of the era, despite being a process requiring repeatedly heating up and melting solid plastic then solidifying it to create layers. In the 21st century, it is being used across a broad spectrum of industries, including machinery, medicine, cosmology, and aviation. In the architectural field, it is actively implemented in the area of structural models. 3D printing has made it possible to overcome the previous two-dimensional blueprints whose buildings only existed within computers, and to observe the structure through three-dimensional diagrams or models. 3D printing has developed even more to the point that it has become possible to build actual buildings.

The 3D printers used in printing actual buildings are similar to the existing Fused Deposition Modeling (FDM) 3D printers which are used to create building models but are starkly different in terms of the scale of the printer or the materials used in the process of printing. Moreover, AI robots play an integral role in construction 3D printing. This is a revolutionary technology in that several digital construction methods and programmable robots are monitored and controlled in real-time to modify and adjust construction processes onsite.

There are several examples of 3D-printed buildings,

such as the house constructed in Winsun, China. This building, which boasts an ornate exterior, only took three days to complete construction, thanks to having created the structure through assembling 3D printed pieces. It is currently in the spotlight within China’s 3D construction industry as it takes little time to build, and the cost of construction is reduced. Another example of 3D-printed buildings are the houses built by the non-profit organization “New Story.” This organization created these houses for the homeless, and it takes less than a day to complete construction. Moreover, any waste that results from the construction process was minimized; the relatively small amount of labor required meant that these houses could be mass-produced at a low cost in little time.

The biggest strength that 3D printing has in construction is its economic feasibility. 3D printing dramatically reduces the time and cost needed for construction. Moreover, through a tailored production, construction materials can be recycled while different buildings can also be rapidly created. However, despite 3D printing’s many strengths, various problems need to be solved. The quality of 3D-printed structures is yet to reach the levels of buildings constructed under the conventional methods of construction. Moreover, large-scale implementation of 3D printing in the construction economy would mean the unemployment of numerous workers in a short period. Therefore, careful consideration of the technological and social issues that may arise from the developmental processes of 3D printing technology is essential[2].

Source: [1] <http://www.siminsori.com/news/articleView.html?idxno=201255>  
[2] <http://nakeddenmark.com/archives/9273>



### Saving Lives with SANBS Drones

**Wihogora XANDRA**



International Student Ambassador

Department of Information and Industrial engineering, Yonsei University



Drones, as part of unmanned aerial vehicle technology, are contributing to helping solve diverse problems in the world. In South Africa, blood banks are now using unmanned drones that are capable of vertical take-off and landing to transport blood to regions that need them. Recently, the South Africa National Blood Service (SANBS) and Western Cape Blood Service (WCBS) introduced a novel way of transporting blood quickly and efficiently to save lives. Dr. Jonathan Low, CEO of the SANBS, said that the drones would be able to “provide a two-way logistics”; on top of supplying patients in need of blood, the patient’s sample will be carried to the blood bank to be tested to safely deliver blood that suits the patient [1].

All over the world, the time needed to transport blood is as a problem. Even worse, in some cases, patients received the wrong type of blood due to mistakes from the deliverer, who is subjected to extremely stressful emergencies. However, the drone technology, on top of reducing delivery time, facilitates testing the suitability of blood types[2]. Transporting blood with drones has been implemented for the first time in South Africa and is funded by non-profit organizations. As such, drones have the potential to become a technology that can ensure safety, health, and even save lives. 🚁

Source: [1] Maseko, F. (Ed.). (2019, May 30). South Africa: SANBS to save more lives using drone technology. Retrieved from [www.itnewsafrika.com/2019/05/south-africa-sanbs-to-save-more-lives-using-drone-technology](https://www.itnewsafrika.com/2019/05/south-africa-sanbs-to-save-more-lives-using-drone-technology)  
[2] Fundisiwe Maseko(South Africa: Healthcare,2019),4th paragraph, <https://www.itnewsafrika.com/2019/05/south-africa-sanbs-to-save-more-lives-using-drone-technology/>

## Deep Learning and Carbon Emission

Luca MEDEIROS



International Student Ambassador

College of Information & Communication Engineering, Sungkyunkwan University

### Common carbon footprint benchmarks

in lbs of CO2 equivalent

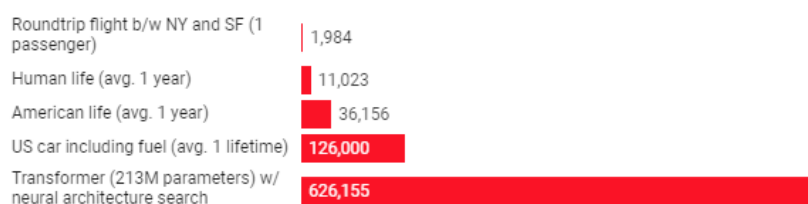


Chart: MIT Technology Review • Source: Strubell et al. • Created with Datawrapper

Recent developments in deep learning technology and relevant hardware has led to an improvement in the accuracy and speed of natural language processing (NLP). As such, numerous studies on the social impact of deep learning technology have been conducted, and the results of an MIT study on training various AI models have been nothing short of shocking. The results showed that in the process of training AI models, more than 626,000 pounds of carbon dioxide was emitted. This is five times the amount emitted by an average American car during its whole life-cycle, including its manufacturing process. However, some researchers, while admitting that a large amount of energy is needed in the training process, raised doubts as to whether the emission rate would reach such large numbers [1].

The team used a single GPU for up to a day to correctly measure energy consumption. Results showed that the Transformer, one of the AI models used in the research, consumed 656,347kWh of energy and had a carbon footprint (the amount of carbon dioxide emitted to cause a greenhouse effect) of 284.019kg. The cloud computing cost was estimated to be around 289,000USD to 981,000USD. These results show that due to the high prices, most people would find it challenging to calculate energy consumption. Most of the models mentioned in the study were carried out away from academia. Thanks to this availability, the accuracy of NLP tasks has improved significantly, but these studies have been limited to industry-related experiments[2]. Chris Priest of the University of Bristol noted that “From an energy perspective, and from a carbon reduction perspective, we should be thinking about designing the services and making sure the algorithms are efficient as possible” [3].

Only environmentally conscious development can assure future generation’s welfare and assume an essential role in integrating positive technologies. The AI industry has much to do in this regard, and relevant sectors must focus on developing efficient technologies to train their AI models in a faster and cleaner manner. 🌱

Source: [1] Hao, K. (2019, June 6). Training a single AI model can emit as much carbon as five cars in their lifetimes. Retrieved from [www.technologyreview.com/s/613630/training-a-single-ai-model-can-emit-as-much-carbon-as-five-cars-in-their-lifetimes/](https://www.technologyreview.com/s/613630/training-a-single-ai-model-can-emit-as-much-carbon-as-five-cars-in-their-lifetimes/)

[2] Strubell, E., Ganesh, A., & McCallum, A. (2019, June 05). Energy and Policy Considerations for Deep Learning in NLP. Retrieved from <https://arxiv.org/abs/1906.02243>

[3] Lu, D. (n.d.). Creating an AI can be five times worse for the planet than a car. Retrieved from [www.newscientist.com/article/2205779-creating-an-ai-can-be-five-times-worse-for-the-planet-than-a-car/](https://www.newscientist.com/article/2205779-creating-an-ai-can-be-five-times-worse-for-the-planet-than-a-car/)



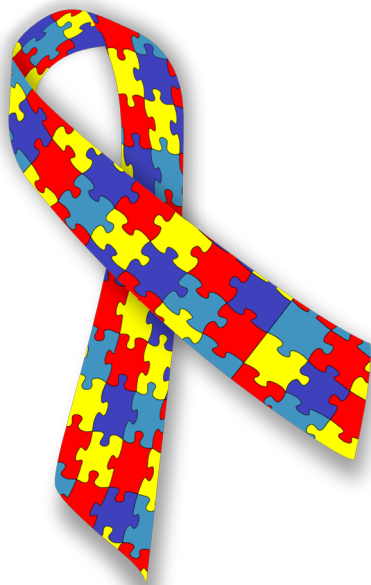
### How ICT Can Help People with Autism

**Roslan NURSHAHIRAH**




International Student Ambassador

Global Leadership Division, Yonsei University



Since 2008 the United Nation has been celebrating World Autism Awareness Day on April 2nd every year in order to raise social awareness of autism spectrum disorder (ASD). As it remains critically low, it is important to inform the public on this issue and provide support for the families those with ASD.

The UN's official theme for 2019's World Autism Awareness Day was "Assistive Technologies, Active Participation". This means implementing assistive technology to help people with ASD so that they may free themselves of obstacles to participate in their communities socially, economically, and politically. "Education and employment: Communication and executive functioning" was one of the issues that was dealt with at the UN 2019 World Autism Awareness Day while assistive technology that may help people with ASD to lead independent lives was given particular emphasis in the "Independent living: Smart home technology and more" discussions [1].

Malaysia has seen a rapid increase in social interest in ASD over the last few years, thanks to the equally rapid rise of social media. This is in no small part to the popularity of the ASD awareness Facebook page created by Zamri Tembol, whose son was diagnosed with autism and attention deficit hyperactivity disorder (ADHD) at the age of three [2]. Tembol said that it was difficult to find information on autism back when his child was diagnosed, and the information that he did find was mostly created within the context of other countries. The Facebook page he started currently has around 70,000 members and is growing continuously. Members of the page can share their experiences and opinions on autism with other who are going through a similar situation. The family members of a child with autism are more likely to open up to others with personal connections to the disorder and it's a good idea for the family members to share the burden, rather than hiding away their pain at home. People with ASD are more likely to be visual learners who are adept at learning through images. Therefore, tablets and other portable devices can assist them in education. ICT will be able to provide a brighter future for those with ASD. 

Source: [1] Autism, autistic, autism spectrum, brain development, health, disability, ASD, Rett syndrome, childhood disintegrative disorder, pervasive developmental disorder, Asperger syndrome. (n.d.). Retrieved June 2, 2019, from <https://www.un.org/en/events/autismday/>

[2] Chandy, A. M. (2019, April 21). Online support for people affected by Autism Spectrum Disorder – helpful or harmful? Retrieved June 2, 2019, from <https://www.thestar.com.my/tech/tech-news/2019/04/22/online-support-helpful-or-harmful/>

## Delivery Platform Economy: from Hope to Dismay

**Diego S. BUTTIGLIERO**



International Student Ambassador

Graduate School of International Studies, Sogang University



Argentina and Spain have recently begun noticing unforeseen issues in the platform economy, and in particular in bicycle delivery service. Several delivery workers in Barcelona burned boxes that had their company's logos drawn on in protest of deaths that occurred during work [1]. Deaths due to the severe working conditions of the platform economy have been happening in several parts of the world, including South America[2]. In Buenos Aires, delivery workers even took to the streets in protest, demanding that they be recognized as employees and asking for fixed pay. As a result, the city court forced the local government to restrict delivery services from carrying out business until they complied with the safety regulations mandated by the city's transportation laws [3, 4].

There are concerns that platform economy businesses such as the delivery services are evading social regulation and safety nets thanks to technology, which leads to an increase in their profits but also a weakening of the social structure. However, it's worth remembering technology itself is not the culprit of such a problem. Technology can help create novel, productive, and innovative social relationships but social, economic, and cultural contexts must be taken into account in the process of developing and utilizing technology. Technology can be implemented to help realize the impending potential of a particular field. From this perspective, technology can play a role in bringing to life potential relationships that may already partially exist in society. In Argentina, many workers in the platform economy are either immigrants or poor who suffer from mass unemployment and structural poverty. The technology that is spearheading the platform economy is currently contributing to the political marginalization of these people, rather than creating a comprehensive social relationship that includes the socially vulnerable. As a result, Argentina's social divide has worsened. The initial hopes that arose thanks to platform economies have been replaced by dismay and a recognition of the need for regulation. However, understanding the core root of the problems that have surfaced in the process of the platform economy expansion remains far in the future. 🌐

Source: [1] Europa Press/EFE. (2019, May 26). Protesta de repartidores de Glovo en Barcelona tras la muerte de un compañero atropellado. Retrieved from [www.20minutos.es/noticia/3652009/0/trabajadores-glovo-protestan-sede/](http://www.20minutos.es/noticia/3652009/0/trabajadores-glovo-protestan-sede/)

[2] Yandex Food Courier Reportedly Dies From Over-Exhaustion, Sparking Outrage in Russia. (2019, April 22). Retrieved from [www.themoscowtimes.com/2019/04/22/yandex-food-courier-reportedly-dies-from-over-exhaustion-sparking-outrage-in-russia-a65331](http://www.themoscowtimes.com/2019/04/22/yandex-food-courier-reportedly-dies-from-over-exhaustion-sparking-outrage-in-russia-a65331)

[3] Primera huelga del empleo 2.0. (2018, July 16). Retrieved from [www.tiempoar.com.ar/nota/primera-huelga-del-empleo-20](http://www.tiempoar.com.ar/nota/primera-huelga-del-empleo-20)

[4] Fallo polémico: Prohíben a Rappi, Glovo y Pedidos Ya hacer delivery en bicicleta. (2018, April 10). Retrieved from [http://www.clarin.com/ciudades/fallo-polemico-prohiben-empresas-delivery-bicicleta\\_0\\_OUmlzF47F.html](http://www.clarin.com/ciudades/fallo-polemico-prohiben-empresas-delivery-bicicleta_0_OUmlzF47F.html)

# BARUN ICT Essay Contest

---

Barun ICT Research Center awards the Best Essay Prize about ICT issues monthly.  
This series publishes the winning student essays each month.

## The Race Against a Jobless Society

**Written By** Hocquard Nicolas

School Of Business / Department Of Business Administration

“What do you want to be when you grow up?” A child’s answer to the question would change frequently, starting with pure fantasy and changing to a more practical and feasible answer as he grows up. My personal experience growing up has led to the following realization: by giving up on my desire to become a magician, I certainly did not gain confidence in determining what I want to be in the future, nor in what I could be. I am quicker in changing my dream job today than when I was 5 years-old, not because my taste or ambition changed, but because I can’t find a stable, middle ground between the jobs I like, and the jobs that make a safe bet for the future. This feeling, that many students like me share, stems from the recognition that technologic progress is accelerating, and continues to mutate the structure of the job market, and confuses our mind when appraising what constitutes a good job. In fact, this debate of how deeply technology will affect society is one of the most polarizing ones, and every day I read and listen to conflicting reports about how technology will change our world, for the better or for the worse. Following in this essay, Yuval Noah Harari, Jeff Ronne, and Jacky Liang, Ben Ramanauskas and Andrey Kurenkov each give us their own opinion on the impact of technologic progress on society and each aims to make sense of the future, and each shall read ideas that time will prove both accurate and foolishly inexact.

While Harari, Ronne, Liang et al. hold different viewpoints on the extent to which AI can substitute to human abilities and therefore affect society and the job market, they agree on the fact that policy response is necessary to avoid the looming adverse outcomes of the fourth industrial revolution. Like Harari, I recognize that one’s ability to learn continuously will determine his likelihood of being satisfied with the future job market. Furthermore, technologic progress inherently creates wealth inequalities, a phenomenon that can be stopped through the implementation of a universal basic income (UBI).



The three authors hold different opinions on AI’s potential to substitute for human abilities, therefore conditioning their interpretation of how its development will affect society and the job market. Harari believes creativity, which is often regarded as uniquely human, is losing its secret to automation. “At least in chess, creativity is already considered to be the trademark of computers rather than humans!” says Harari [3]. However, Harari’s outlook for the job market is not all that gloomy; he believes humans and machines will most likely complement each other rather than compete. On the other hand, Ronne, is more radical; he believes man is no match for robot. “Ever more intelligent automated machines have senses that are superior to humans in many respects, as they can see, touch and hear in multiple directions simultaneously... These machines are and will be superior to human workers in almost every aspect.” [5]. Drawing on the example of the Silicon Valley, where he works as an Investor and software engineer, Ronne says the trend is clear, the most profitable companies are the most productive ones, and the means to achieve ever higher

# BARUN ICT Essay Contest

---



productivity remains the “use of capital investment to replace human jobs with ever cheaper ever more intelligent automated machines” [5]. Hence for him, jobs will simply cease to exist in the future, “this is only a question of when, not if” [5]. In contrast with these conservative interpretations, Liang et al. believe the threat of AI is vastly overestimated and unwarranted, stating that the scenarios of massive automation boasted by some media “extrapolate the impact of AI from newsworthy demos that are cherry picked” [4]. They say that while AI outperforms human on many routine tasks, only rarely will a job present the opportunity to be fully automated. They further point to specific “computerization bottlenecks” – abilities such as perception, manipulation, creative and social intelligence - that will hardly be replaced in the near future. Lastly, Liang et al. point to a concern, “that automation will not displace jobs evenly across countries, industries, education level, socioeconomic status, age, and gender” [4], hence the certain need for policymakers to take action and coordinate a transition, whatever its magnitude.

Whether we face a scenario of grave unemployment, a silent deepening of inequalities or a restructuring of the labour force, policymakers will have to come up with tools to safeguard social stability. Harari insists on the importance of regulating data. As he says “data will eclipse both machinery and land as the most important asset” in the 21st century, hence to “prevent the concentration of all wealth and power in the hands of a small elite, we must regulate the ownership of data” [3]. For Harari, regulating data is not only a matter of aiming for more economic equality but also to make sure that we do not imprison ourselves in what he calls “digital dictatorships”. Ronne believes that a first policy action should be to tax robotic workers and use proceeds to support a universal basic income (UBI) that would replace all welfare programs. He argues that as wages get pressured down by machines and excess labour supply, we are to “transition to a society where work is optional as most people do not work to sustain themselves, and instead rely on universal basic income” [5]. This, he says, will be necessary, as a growing majority of people will not be able to work for a living without government assistance. Liang et al. share Ronne’s vision that we need to attempt new approaches, also citing the robot tax and UBI. Their main point, however, is “upskilling displaced workers” [4] as a means to increase fluidity in the labour market to prevent structural unemployment. Change will be a feature of the coming decades, and it will need to be handled, some way or another. Structural unemployment “has been slowly rising in the past decades, and will get worse if automation replaces jobs faster than workers can be retrained” [4]. Therefore, importance for politicians to push for an environment that nurtures continuous learning is growing.

While we hope that our policymakers will react timely and accordingly, I would not recommend anyone to put his future in anybody’s hands other than his own. Drawing on Harari’s idea, a major guiding principle that one can follow responsibly to be at better odds in the future: continuous learning. In the future, “people will need to retrain and reinvent themselves not just once, but many times” [3], says Harari. Learning is a high-risk activity, a lot of time is invested but the knowledge acquired may have less value than expected, but learning is not an option. Thankfully,



the 21st century provides us with an unprecedented amount of opportunities to learn voraciously; raw knowledge is available everywhere, and it is only waiting to be digested, mastered, and blended. As Professor Brynjolfsson from MIT says, people will “have to commit to a lifetime of practicing and updating their skills” [2]. He who understands this, deeply, has a good hedge against unemployment.

Continuous learning is essentially a race, but a very discriminating race. I believe that inequalities are a natural by-product of technologic progress, and to prevent a deeper social divide, policymakers in developed markets should make UBI their priority. As Ronne explains, companies will prioritize automation of jobs that will result in the highest savings, with one constraint however: that automation is technically feasible. The bulk of jobs being automated are neither at the top or bottom of the wage distribution but somewhere in the middle. Hence, we end up with a very uneven distribution of labour that takes the form of a “barbell-shaped” distribution, as observed by Professor of Economics John Autor from MIT [1]. The induced problem is that, of the displaced workers, only a small share will be able to upgrade its skills and remain competitive, while most likely, the majority will settle for a lesser rewarding job. Consequentially, the income disparity will widen and a growing amount of people will get squeezed out at the bottom of the income distribution, with an always smaller amount of people sharing the income pie of high-value-added jobs.

Unless we implement UBI, the widening social divide will materialize. UBI will filter out people who work by necessity, decreasing the supply of labour at the bottom of the income curve, which will in turn contribute to eliminate downward price pressure at least, and raise income at best. A sound argument to achieve similar outcome would be to raise minimum wage gradually, but as Ronne points out: “any attempt to raise the minimum wage – an argument often put forward by policymakers - will be counterproductive as it only gives more incentives for companies to make additional capital investment in automation” [5]. On the other hand, as UBI discharges people from the obligation of work, the amount of time they could spend on educating themselves would rise drastically. UBI will not eliminate inequalities – this is a utopia – but it will, at the very least, reduce its widening gap and eliminate objective precarity.

The little consensus achieved by these passionate authors teaches us one thing: the future can unfold in many ways. A jobless society seems inevitable, but the timeline is blurry. Uncertainty is inherent to life, and the best way to cope with it is to prepare for the worse. As an individual, I believe one should strive to learn continuously and live effortfully. The convenience brought by technology should not make people complacent but more alert and watchful. Some may succeed in navigating the future dexterously, but majority of people may not. Society already seems engaged on a slippery slope of growing inequalities, and if left untouched its trajectory probably won't change. The future may be jobless, but it does not have to be cruel. What then should our kids want to be when they grow up? John Lennon, at age 5 famously, had a beautiful answer to this “Happy.” 🎨



Sources: [1] Autor, David. “Polanyi’s Paradox and the Shape of Employment Growth.” 2014, oi:10.3386/w20485.

[2] Brynjolfsson, Erik & Andrew McAfee. “Brynjolfsson and McAfee: The Jobs That AI Can’t Replace.” BBC News, BBC, 13 Sept. 2015, [www.bbc.com/news/technology-34175290](http://www.bbc.com/news/technology-34175290).

[3] Harari, Yuval Noah. “Why Technology Favors Tyranny.” The Atlantic, Oct. 2018.

[4] Liang, Jacky, et al. “Job Loss Due to AI - How Bad Is It Going to Be?” Skynet Today, 4 Feb. 2019, [www.skynettoday.com/editorials/ai-automation-job-loss](http://www.skynettoday.com/editorials/ai-automation-job-loss).

[5] Ronne, Jeff. “Will automation destroy more jobs than it will create?” Online Posting. 15 November 2018. Quora. Quora.com. Web. < <https://www.quora.com/Will-automation-destroy-more-jobs-than-it-will-create> >

## Digital Distraction: The New Normal

Written By Seung-eun LEE

College of Sciences in Education / Department of Education

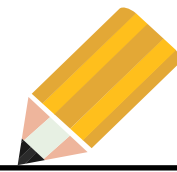


Once, most people believed that multitasking, doing several things at the same time, is an efficient use of time. These days, multitasking is considered a myth. Is it a distraction then? People do not consider themselves distracted when they are skimming through SNS during a holiday dinner. They feel distracted when they are skimming through a book before their exam day or when they are opening up their phone while trying to solve math problems. From this point of view, distraction is "pieces of goal-irrelevant information," [2] as distraction only occurs when something interrupts us from putting our best to achieve our goals. What are the usual suspects in this distraction game? Nicholas Carr, Steve Volk, and Robinson Meyer blame digital technologies as the main culprit.

Carr, Volk, and Meyer all agree that technology is diffusing our attention. However, Carr blames the Internet for the cause of the distraction while Volk and Meyer blame the digital devices. I agree with the authors that the technology is lowering our ability to stay focused on one thing, but the proposal that Meyer gives is not a solution because I believe that the way we concentrate has changed.

According to the authors, technology lowers our ability to sustain our focus, distracting our concentration negatively. Carr points out that the Internet related media "scatter our attention and diffuse our concentration" [1]. He argues that when people get used to the new type of media, people can't read and stay focused as before. Similarly, Volk argues that digital technologies distract students, causing a decline of their ability to concentrate. He introduces some research about how students easily lose focus when they use digital devices, stating that the devices distract the user and the people around the device. Adding on to Carr and Volk, Meyer points out that the digital device can become a most relevant thing to the user no matter what is going on. He visualizes this phenomenon, saying that a smartphone "becomes a magical device that silently shouts your name at your brain at all times." [3] Since the device is calling its owner for the attention consistently, the owner keeps worrying about the device, making it harder to pay attention to other things.

Although the three authors agree that the technology negatively affects human ability to concentrate, they have different points for the cause of the distraction. While Carr blames the Internet, Volk and Meyer accuse the gadgets. Carr argues that the Internet diffuse our concentration, changing how we understand information. Carr claims that "[m]y mind now expects to take in information the way the Net distributes it" [1]. According to him, as we get used to the Internet, it gets harder for people to take in information in traditional ways. Conversely, Volk and Meyer focus on digital gadgets. For them, gadgets are attractive objects that distract concentration. Volk argues that using digital devices in classroom diffuses the user's attention significantly. According to Volk, even when students use the devices on educational purposes, the devices draw the user's attention and also fascinate the nearby peers [4]. The fact that the device is in front of them lures the students to chat, text, shop, email and watch movies in classroom. Adding on to Volk, Meyer insists that even the struggle of the users to avoid using the devices takes away their attention. He notes that "a smartphone can demand its user's attention even when the person isn't using it or consciously thinking about it," [3] because we use mental energy to avoid the attraction on purpose. The gadgets are so attractive that using the gadgets and trying not to use the gadgets both give negative impact on our concentration.



Having read the three articles, I agree with the authors that our ability to focus on one thing is disturbed by technology, whether it is the Internet or gadgets. However, considering the close connection between the technology and our lives, the digital distraction does not seem so negative. It is true that digital distraction is happening so often. Paying attention to one thing at a time is a difficult task. Carr argues that as we get used to the Internet, it becomes harder to stick to one article. Rather, we skim and hop to other writings, just like how we surf through the websites on the Internet. This action doesn't happen only when we read. Adding on to Carr, the other two authors talk about how smartphones enable people to carry out several tasks at a time. With a smartphone, we can easily surf around the Internet not only when we read or study, but also when we rest or have fun. Nowadays, reading a book alone is not how we enjoy our holidays. We read an e-book on one hand and text to friends with the other hand while listening to music. Digital distraction has become the new normal so why is it a problem we have to solve?

While Meyer insists that we have to solve this problem by getting rid of the digital gadgets, I believe that digital distraction is just a new way we concentrate. Meyer argues that trying not to use digital devices does not work and recommends that the dependent users should "just put their smartphone in another room" [3]. However, he also points out that the digital devices can distract the users even when they are turned off. It seems practically impossible to not use the digital technologies, regardless of the negative effects since so much of our life has become closely connected to the new technology already. As Carr mentioned, people worried about the development of the writing and printing with the arrival of Gutenberg's printing press because of the change it will cause. The concerns of the past against printed books echo the concerns today against the Internet such as "intellectual laziness" and "weakening of the minds" [1]. Even if the technology gives unwanted effects to the users, just banning the devices will not solve the problem. According to Volk, digital devices are now used for many effective educational purposes, such as presentation, sharing ideas, and research. Teaching how to manage technology to the young students is essential for their lives, too.

Thus, simple and extreme methods such as the one Meyer proposes to get rid of all gadgets is not realistic. I believe we need to redefine concentration similar to the way Neil M. Richards suggested a redefinition of privacy to include managing data in his article "Four Privacy Myths". By broadening the definition of concentration to include multitasking will allow us to manage the digital distraction more effectively. Paying attention to several tasks at once is the new form of concentrating in the new era. This is similar to multitasking, but just as Volk and Meyer states, the multitasking in the new era is not exclusive to efficiency. Working on different tasks at once is no longer for the sake of saving time rather a new way of using time. This new concentration style is neither good nor bad. Rather than looking only at the negative side of digital distractions, we should redefine concentration to include multitasking. By learning to pay attention whenever distractions are abundant, we can take advantage of digital technology and learn to concentrate in a pool of distractions.

In conclusion, I agree with Carr, Volk, and Meyer that digital technology has a huge impact on our concentration. We have to be more aware of how the technology can negatively affect us so we can make changes in our usage and exposure to the technology. However, the method Meyer suggested to handle the problem is unrealistic, considering how we are closely connected to technology. Multitasking is not just a distraction. We can still pay attention while we work on several tasks at once. By redefining concentration as the new normal and managing the digital distraction, we will be well-equipped for the new era. 🤖

Sources:

[1] Carr, Nicholas. "Is Google Making Us Stupid?" The Atlantic, 1 July 2008.

[2] Grazzely, Adam, and Rosen, Larry. The Distracted Mind: Ancient Brains in a High-Tech World. MIT Press, 2016.

[3] Meyer, Robinson. "Your Smartphone Reduces Your Brainpower, Even If it's Just Sitting There." The Atlantic, 2 August 2017.

[4] Volk, Steve. "Digital Distractions? Technology, Teaching and Learning in the Contemporary Classroom." The Atlantic, 12 February 2018.

## Barun ICT Research Center, Yonsei University Research Professor/Post-Doc Recruitment



YONSEI  
UNIVERSITY



Barun ICT  
Research Center

### Hiring field

**Engineering:** Computer Science/Engineering, Data Science, Artificial Intelligence (AI), Machine Learning (deep learning), or other relevant area

**Social Science:** Psychology, Sociology, Economics, Business, or other relevant area

### Responsibilities

- Research that is in line with Barun ICT's research objectives.
- Exchanges and co-op research with other universities, research centers, and public institutions.

### Application Process

Submit a resume, cover letter and research plan by email to [barunict@barunict.kr](mailto:barunict@barunict.kr)

### Inquiries

For further information, please refer to [www.barunict.kr](http://www.barunict.kr), contact us at 02-2123-6694, or scan the QR code.



\*The Barun ICT Newsletter provides the latest information on ICT research trends, as well as results of innovative research.

\* Please note that any external contributions to the newsletter (Columns, Global News) do not represent Barun ICT's official views.

\* If you would like to receive a monthly newsletter from Barun ICT via e-mail, please email us at [news@barunict.kr](mailto:news@barunict.kr).



Publisher Beomsoo Kim | Editor-in-Chief Yunmo Koo, Miyea KIM  
Editor Yoonhee Jang | Designer Yeeun Lee,  
Translator Hyun Don Moon, Alexandra Stephenson

Yonsei University, 50 Yonsei-ro, Seodaemun-gu, Seoul 03722, Korea  
+82-2-2123-6694 | [www.barunict.org](http://www.barunict.org)

