Title: AI, ally or foe against environmental change?

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These days, AI brings great and intense attention as a topic. But not many people know what AI means. Usually, the public associates it with Alphago thinking that it has to do with robots. To be specific, robotics engineering and AI are two separate areas. Indeed, robots based on AI are currently being developed. Then what is AI? **AI** is usually defined as a computer system to imitate a part of human intelligence such as recognition and learning. One of the well-known AI technologies is a self-driving car. Although level two which needs a driver’s assistance is just commercialized in reality, it is valid that AI is expected to take up a huge part in the car industry later on. Did you know that AI technology is used in the camera of our very own smartphones? Image recognition technology is used in Portrait mode on iPhone and Live focus on Galaxy. This technology figures out what the subject of the camera is and sets a setpoint that best expresses the photo. Following these examples, AI is being adopted in the area of the environment as well.

According to the AI Times, Korea recorded eighth place in energy consumption in the world in 2017. But in the area of energy efficiency, measured in terms of GDP, Korea remained 33rd place among 35 OECD countries. One of the solutions to the problem was the development of AI technologies. These days lots of AI technologies are working as an environment keeper.

Here’s an example. SK eco-plant developed an eco-friendly incinerator with Amazon Web Services, using AI technology. The objective of the development was to intensify the efficiency of managing the destructor and to decrease contamination emissions. This AI solution is embodied by a cloud technology through Amazon Sagemaker Service which helps the ML model to be swiftly constructed, trained, and distributed. Then how does this work? Data is collected through CCTVs, sensors, and PLCs, a control unit that is capable of programming. AI algorithm analyzes and predicts environmental effects through these data. Next, this incinerator has the benefit of an AI solution that notifies the driver of the optimal way of managing the incinerator. As supervising incinerator facilities in person was criticized for the difficulties of managing contaminant emissions, the change occurred by AI was well appreciated environmentally. Besides, the eco-plant has the function of sensing facility defections in advance and reducing noxious contaminants such as NOx and CO. The first place where this AI solution was applied was Chungcheong Environmental Energy Co, an SK eco-plant located in Chungcheongnam-do. Through training of 60 AI algorithms for 90 months, it concluded that maintaining the temperature of 950~ 1050°C can minimize the emissions of contaminants. By the guidance of AI, 66% of carbon monoxide and 36% of nitrogen oxide decreased in the factory.

Although working in diverse areas as a protector of the environment, AI is also responsible for environmental problems. According to Gary E. Dickerson, CEO of Applied Materials, if we construct an AI Datacenter with current technology, we’re going to consume 15% of worldwide electricity in the data center until 2025. Furthermore, as AI consumes a huge amount of electricity, the emission of carbon dioxide increases. This is a severe situation because the amount of data AI uses will continue to increase over time. It is predicted by Gary E. Dickerson that 90% of the amount of worldwide data will come from AI in the future. Virginia Dignum, a professor at the Department of Computer Science at Ume university, argued that the more we use AI, the more carbon hydrate is emitted. It is said that even voice recognition apps and Netflix recommendation algorithms contribute to environmental pollution.

Due to this fatal deficiency of AI, lots of efforts are funneled into solving this problem. One of the efforts is to develop low-power semiconductors and renewable energies. Semiconductors such as GPU are mostly used in the training process. The semiconductor is an electric property that is somewhere between a substance that does and doesn’t conduct electricity. They are used as a companion of AI to heighten the velocity of the training process and contain plenty more data. Recently, semiconductor companies are researching ways to diminish electricity consumption and use alternative energies. In the case of SK Hynix, they developed the D-RAM model DDR5, which works as a storage that contains data that the computer processor demands. The model enabled a reduction of 43% in electricity consumption compared to the previous model named DDR2. Another company, Applied Materials managed to reduce carbon emissions in the process of producing semiconductors and even planned to replace electricity with alternative energy until 2030.

In conclusion, indeed AI technologies are playing a huge role in reducing energy consumption. However, the view that AI is also polluting our environment in a way is relevant as well. Numerous companies are working tirelessly to minimize the flaws of AI, but we can’t say that AI itself is just eco-friendly to our environment at the moment. As AI is applied in numerous areas, it is significant to use AI wisely, always thinking about the consequences of using it.