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Influence of Artificial Intelligence on Semiconductors in the Cross-Era

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ABSTRACT

Artificial intelligence (AI) of the intrinsic changes in semiconductors is stated and reviewed in this paper. Similar to how the brain functions, a software that reforms AI is essential. Other components such as vision, auditory, hearing, and taste sensations are also crucial. These changes will cause the production line to change. This will further affect our future applications. Of course, our education is deeply far-reaching.

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Abbreviations

AI: Artificial Intelligence

Artificial intelligence (AI) has deeply influenced our lives [1,2]. It helps to accurately, easily, and rapidly find information via webpage searching, realize more accurate and rapid translation technology, and improve the efficiency of design works from conceptualization to industrial mass production. The development of splicing technology has shown an inaction structure, attributable to essential changes in semiconductors.

Perspective of Human Senses

In the software section of AI, as in the human brain, enormous information is needed for training and learning. Therefore, appropriate information should be collected and cleaned up. The first choice is to develop an appropriate algorithm, e.g., decision trees, neural networks, and support vector machines. The algorithm development usually involves splitting data into training and test sets. The former is used to train a model, whereas the latter is used for performance evaluation and optimization by adjusting the algorithm parameters. The trained model is then deployed for application and continuously monitored and updated to maintain optimal performance.

Notably, AI is a multidisciplinary field that is highly intricate. An AI camera is used to automatically capture images and record videos. Visual sensing, a conscious function, is widely used to focus light for image capturing. Moreover, there are various signal processors for hearing, and sound signals can be converted to digital signals. In an auditory system, the microphones should use an acoustic system, which comprises a mixer communication filter and spectrum analyzer, to effectively capture sound signals. Meanwhile, we need to use an emulator on the speaker side, and an infectious simulator is needed to create a sound signal. Figure 1 Shows a microphone used in an AI voice device.

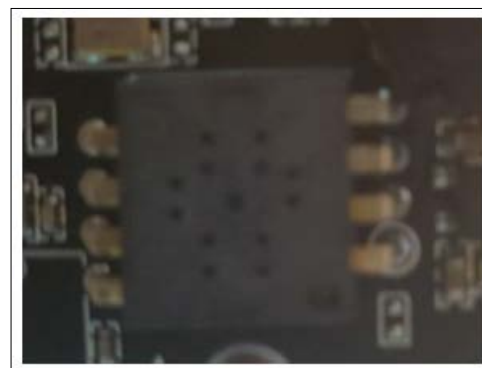


Figure 1: Microphone Image used in an AI Voice Device

AI is used for detecting harmful chemicals in the air, such as volatile organic compounds and other harmful gasses. An AI spectrometer is used to detect electromagnetic radiations in the air, such as infrared and ultraviolet rays. High-precision AI taste recognizers are used to identify different essential flavors. AI machines are also used to perform various action tasks, such as moving and gathering items. For communication, a 2.4-GHz antenna (Figure 2) is used in an AI device to make a near-field connection to a certain Wi-Fi device.

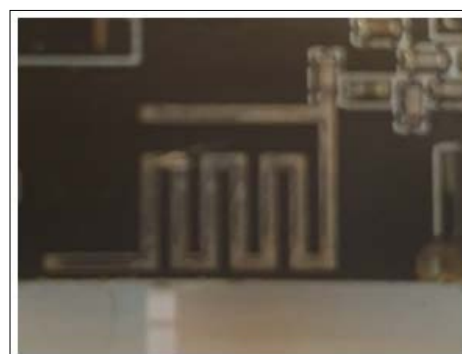


Figure 2: 2.4-GHz Antenna for a Wi-Fi Connection

Changes in the Production Line

AI technology on a chip production line optimizes the manufacturing process. Through data analysis and machine learning, we can realize intelligent production line management to improve production efficiency and product quality. Using AI technology, production line quality can be predicted and monitored. AI technology can provide an early failure warning in a production process using key production parameters. Production costs can be reduced by employing deep learning to analyze production data, optimize parameters and procedures, and maintain a stable and consistent production line. Using AI technology to optimize warehouse management can improve material usage rates and decrease inventory pressure, thereby improving the supply chain efficiency. Robots, automation equipment, and unmanned vehicles improve the manufacturing line's level of automation.

Application Fields of AI

AI substantially influences almost every aspect of life, as expert systems are widely used currently to solve complex problems in various areas, such as science, business, medicine, and weather forecasting, to improve quality and efficiency [3].

AI can be employed to analyze and understand human language and perform dialog, translation, and text generation tasks. AI can learn massive data for enhanced predictive analysis and clustering tasks. Moreover, AI can be incorporated into graphics, recognition objects, personnel identification, and other technologies. AI can use risk assessment, investment decisions, customer service, and other aspects to improve the efficiency and quality of financial services. AI can perform perceptual decisions and control to realize automatic driving, thereby improving traffic safety and efficiency [3].

Strengthen Basic Disciplines

AI is a branch of computer science capable of analyzing complex medical data. AI can improve diagnosis, treatment and prevention, efficiency, and quality of health care. Its potential to exploit meaningful relationships in a dataset can be used in diagnosis, treatment, and prediction of outcomes in several clinical scenarios [4,5].

Conclusions

The age of AI has arrived. Projects involving AI range from object cognition to action motion. AI has influenced production lines in various aspects. Consequently, we are exploring ways AI can influence the field of semiconductors.

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