

# The Impact of Artificial Intelligence on the Development of Industrial Design

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## Abstract:

Artificial Intelligence technology has developed rapidly and has penetrated into all levels of human society. In order to break through the current bottleneck of development, China's Industrial Design must closely follow technological trends such as Artificial Intelligence. By learning and understanding Artificial Intelligence technology, combine technology with art design to promote the development of the Industrial Design industry. Based on this, this paper analyzes the impact of Artificial Intelligence on Industrial Design by expounding the development status of Industrial Design and Artificial Intelligence, and finally draws a conclusion: under the premise of reasonable use, Artificial Intelligence can promote the development of Industrial Design into a new field and create better living conditions for human beings.

## Keywords:

Artificial Intelligence, Industrial Design, Technology, Art, Impact

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## 1. Introduction

Science and technology have changed life. From the three industrial revolutions experienced in the 1760s to the present, human beings have moved from the "Steam Age" to the "Electric Age" and then to the "Information Age". With the rapid development of the times, human beings have begun to enter the "Era of Intelligent Technology". In recent years, the technologies covered by intelligent manufacturing have been widely used in the design and manufacturing fields of aviation, highways, and products, some countries and regions hope to regain the competitive advantage of manufacturing through technological progress and adjustment of industrial policies. The United States has put forward strategies such as "Reindustrialization", "Restructuring Manufacturing" and "Return to the Homeland", while Germany has put forward the "Industry 4.0" strategy, other countries in Europe have put forward the requirement of "Substantial Increase in the Share of Industry in GDP", Japan released the "Manufacturing Competitive Strategy", India proposed the concept of "Made in India", etc. These countries and regions have successively proposed development strategies related to intelligent manufacturing. However, China also put forward the grand plan of "Made in China 2025" in 2015, our design and production began to develop from automation to intelligence, in the next ten years, China's

manufacturing industry will adhere to innovation-driven, intelligent transformation, strengthening of foundation and green development to step out of its own characteristics, and accelerate its progress towards a manufacturing power. It can be seen that intelligent technology is complementary and inseparable to national industrial manufacturing and Industrial Design, Artificial Intelligence technology is one of the core tools in the era of intelligent technology, and it is also a frontier topic of current technological development. Based on this, the influence of Artificial Intelligence technology on the development of Industrial Design is expounded by studying the concept, main form, development status and the relationship between Artificial Intelligence technology and Industrial Design.

## 2. Industrial Design and Artificial Intelligence

### 2.1. Overview of Industrial Design

The term “Industrial Design” first appeared in 1919 and was first proposed by American designer Joseph Sinell. [1] However, the concept of the discipline “Industrial Design” can also be traced back to the Bauhaus school in Germany in 1919, which has a history of more than 100 years. [2] As early as 1980, the International Council of Societies of Industrial Design (ICSID) made the following definition of Industrial Design: “In the case of mass-produced industrial products, by virtue of training, technical knowledge, experience and visual perception, the material, structure, structure, form, color, surface finishing, decoration with new qualities and specifications is called Industrial Design.” Different scholars have different views on the definition of Industrial Design, some scholars believe that Industrial Design is a concept that emerged with the development of the large-scale machine industry in the process of the high development of human social civilization. it is the product of the combination of science and technology and culture and art. [3] However, some scholars believe that Industrial Design is an integrated creative activity that takes industrial products as the main design goal, and uses scientific research results and knowledge of society, country, finance, knowledge and structure to improve the function, structure, shape and appearance of products. [4]

The development of industrial design in China started relatively late. China introduced the concept and mode of Industrial Design from other countries in the early 1980s. Due to the limitations of social background and demand at that time, the research, development, production and sales of Industrial Design were limited, so educational Industrial Design based on theory came into being. [5] At the end of the 20th century, with the improvement of China's social productivity level, China's Industrial Design began to carry out research in product research, development, production and sales. In addition, with the advent of the Internet era and the support of national policies, China's Industrial Design has gradually matured. However, there are still many problems in China's Industrial Design innovation research, such as China's insufficient understanding of the impact of Industrial Design innovation, Industrial Design innovation being ranked after economic development, lack of intellectual property rights and independent design innovation ideas, and lack of innovative design talents. [6] The author believes that it is important to cultivate innovation ability, but good ideas and good creations must be supported by strong high-tech technology, in order to truly achieve “innovation” and to break through the bottleneck problem of China's Industrial Design development.

## ***2.2. Artificial Intelligence***

Artificial Intelligence is a new technical science that studies and develops theories, methods, technologies and application systems for simulating, extending and expanding human intelligence. It is the ability of computer systems to perform complex tasks that can only be accomplished by human intelligence. It is to make the computer realize the transformation from “Smart” to “Intelligent”, it can think rationally and then act rationally like human beings. [7] The field of Artificial Intelligence includes major branches such as robot intelligence, speech recognition, expert systems, natural language processing, and image recognition. [8]

The term “Artificial Intelligence” was first put forward at the Dartmouth society in 1956, at that time, researchers had a strong interest in Artificial Intelligence, after nearly 70 years of development, Artificial Intelligence has made great achievements in theory and technology, at the same time, its fields are also expanding, in the future, Artificial Intelligence may bring more technological products to facilitate people's lives, which will become a major crystallization of wisdom in the history of human civilization development. The combination of Artificial Intelligence and Industrial Design is to introduce Artificial Intelligence algorithms in the process of Industrial Design, use Artificial Intelligence algorithms to integrate professional theoretical knowledge used in Industrial Design with design goals, design directions, design requirements, innovation points, etc. Thereby building a complete design process and product.

## **3. The Impact of Artificial Intelligence on the Development of Future Industrial Design**

The emergence of Artificial Intelligence can promote the development of Industrial Design to break through difficult bottlenecks and open up new paths. But everything is the unity of opposites, and the impact of Artificial Intelligence on the development of Industrial Design in the future is also “two-sided”. While affirming the positive impact of Artificial Intelligence on the development of Industrial Design, it should also be deeply reflected.

### ***3.1. The Role of Artificial Intelligence in the Development of Future Industrial Design***

In the future, Artificial Intelligence will participate in the process of Industrial Design to help designers better design and create, designers can integrate their own ideas and inspirations through Artificial Intelligence, and then input some customer requirements and reference design works and creative styles, in this way, Artificial Intelligence can automatically integrate all the above information, and provide designers with more innovative and effective design solutions, helping designers get rid of fixed thinking frames and inspire inspiration to create better design works. Secondly, Artificial Intelligence can enhance and improve computer-aided design technology, strengthen designers' operational tools, and help designers use computers to assist decision-making. [9] At the same time, the design of intelligent products based on Artificial Intelligence technology, such as sweeping robots, smart cars, and smart home interconnection systems, provides great convenience for human life, and these products or systems are closely related to Industrial Design. Artificial Intelligence provides technical support for product design and manufacturing, and Industrial Design methods provide design paths for product design and manufacturing,

through the combination of Artificial Intelligence and Industrial Design, more intelligent and excellent products can be designed and produced, and people's lives will be more convenient.

### ***3.2. Reverse Thinking of Artificial Intelligence on the Development of Future Industrial Design***

With the continuous development of Artificial Intelligence, in the future, the powerful autonomous ability of Artificial Intelligence will enable Artificial Intelligence to think and imagine like human beings, and even surpass human intelligence. In the “11.11” shopping party in 2017, Alibaba's first intelligent designer “Luban”, the total number of banners it has designed is as high as 400 million, the speed of “Luban” designing 8,000 banners with different ideas per second is unmatched by human designers. It takes 173 days of continuous work for human beauty editors to complete the same amount of work. [10] Although shopping posters are all designed by computers, shoppers do not notice the design difference, in this environment, designers and Artificial Intelligence have formed a competitive relationship, even if this intelligent technology platform is not yet mature, the competitive trend of Artificial Intelligence for human occupations has gradually been exposed. Therefore, designers must improve their keen observation and fully improve their thinking to conceive better design solutions, otherwise, there is a real possibility that designers will be replaced by Artificial Intelligence someday in the future. How to reasonably use Artificial Intelligence to assist design and guide the upgrading of Industrial Design concepts and models is a hot research issue at present. With the continuous development of Artificial Intelligence in various fields, in the future, Artificial Intelligence will be perfectly integrated into the process of Industrial Design to help designers better carry out creative design. Therefore, on the basis of mastering design knowledge and capabilities, it is necessary for designers to understand and be familiar with Artificial Intelligence as an effective tool and make reasonable use of it, through the integration of science and art design, to drive the continuous development of design, so as to promote the continuous improvement of the level of Industrial Design.

## **4. Conclusions**

French writer Flaubert said: “The further we move forward, the more scientific the art, and the more artistic the science. Science and art are like two people who have climbed the same mountain in different directions. They part company at the foot of the mountain, and they will meet again at the top of the mountain. Together, they will run towards the most lofty ideal realm that human beings yearn for - truth and beauty.” [11] In fact, science and art can be perfectly integrated, and Artificial Intelligence and art design can also be perfectly integrated. After more than 60 years of development, Artificial Intelligence has become a major trend in the development of the digital age, driving the development and progress of many industries. At present, Artificial Intelligence has been able to replace humans in some simple artistic design creations, and industrial design generally involves a lot of related domain knowledge. As far as the current level of Artificial Intelligence is concerned, there are still many problems in industrial design. However, with the continuous development of Artificial Intelligence technology and the improvement of the level of intelligence, with the blessing of Artificial Intelligence and other technologies, one day in the future,

industrial design will definitely break through the development bottleneck and contribute more to the progress of human society.

## Conflicts of Interest

The author declares that there is no conflict of interest regarding the publication of this article.

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