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## *The “Undefined” Future of Mobility Innovation: Concepts, Method, and Paradigms*

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# The “Undefined” Future of Mobility Innovation: Concepts, Method, and Paradigms

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## Abstract

In 2006, the Central Academy of Fine Arts established a mobility innovation design education program to contribute to China’s automotive industry in the early stages of its development. The department committed to developing a Chinese standard of mobility innovation design education and discussing China’s standard of mobility innovation design education in the global industrial context. In disciplinary stages from automotive design to transportation design, mobility innovation design, and under the changing contexts of production design, design of design, interface design, and computational design, mobility innovation design education relies on industry-academy cooperation to form a teaching method and development paradigm with both internationalization and localization from Chinese characteristics, responding to the changes of the times and education with an “undefined” attitude.

## Key words

Mobility innovation design, teaching paradigm, industry-academy cooperation

The Automotive Design Direction was initially established in the School of Design in 2006, marking the beginning of this century’s mobility innovation design education at China’s Central Academy of Fine Arts (CAFA). The decision to establish a department with seemingly strong engineering attributes in an art college was based on an in-depth study of the role of design disciplines in the development of automotive design. Professor Pan Gongkai, president of the academy at the time, made this choice after realizing that the system of fine art education formed the foundation for all successful automobile design education worldwide.<sup>1</sup> Another significant factor was the legacy of the CAFA in serving the nation and people through art and design education. In the early stages of development, the academy was required to make contributions to China’s automotive industry through design education. By 2008, in order to be in line with its global counterparts, the major was renamed Transportation Design, and internationalized education and research began through cooperation with faculty members and curriculum.

By 2017 the global automotive industry was evolving from manufacturing to a high-tech industry, and China became the most active industrial innovation “laboratory” for the automotive industry and mobility services around the world. As a result, automotive design education has changed from transportation to mobility innovation, prompting the official renaming of the major to mobility innovation design. For the college to achieve its national obligations for the industry through the integration of science, education and industry-academy cooperation, building and developing the Chinese standards for mobility innovation design education has emerged as an important concept.

## 1. Disciplinary Concepts

From automotive design to transportation design, and then to mobility innovation design, there has been a continuous upgrading of concepts through different periods in this discipline.



Figure 1. Studio of Mobility Innovation Design Direction, School of Design, CAFA.

The discipline's primary emphasis during the automotive design stage, which began in 2006, was on product trend forecasting, advanced design research, and automotive aesthetics. According to the highly specialized division of labor that resulted from the industrial revolution, the program was training skill-based design students who could work right away in the automotive sector after graduation. This concept has been systematically upgraded by introducing international education standards in the transportation design stage. The program formed a curriculum structure that incorporated both internationalization from global industrial standards and localization from Chinese industrial characteristics. Then, in the context of emerging technologies and industry iteration, the concept of mobility innovation design was created, which is technology-driven but not limited by technology. The word innovation is preferred, rather than smart or intelligent, to emphasize the applicability of technology in the research; smart cars will no longer be merely a means of transportation. On the one hand, due to the liberation of users brought about by autonomous driving technology cars will become a cross-domain integration platform of user experience. On the other hand, due to the threshold of algorithms driven by the growing computing

power of microchips cars will eventually enter a monopoly mode in business model terms. Therefore, the design discipline requires new approaches in education at this stage.

The creation of a "new species" in intelligent mobility that will alter lifestyles, influence production techniques, and reshape social forms, the study of "scene flow" formed by the interaction of the "new species" and existing social infrastructure, and the exploration of the "ecological niche" of the "new species" and "scene flow" in the near future are all highlighted in mobility innovation design. Mobility innovation design also emphasizes the reconstruction of the design standards and research logic of the automotive industry. Undoubtedly, "new species" and "scene flow" will be two critical tools for developing the concept of mobility innovation design education.

## 2. Teaching Method

Industry-academy cooperation is essential to the education system of mobility innovation design at the CAFA. Focusing on the industry as the basis of the discipline's development, the department has completed a large number of cooperative projects with partners



Figure 2. Chris Bangle, former BMW Design Director, and Sushi Choi, former Vice President of CCS, present the Most Successful School Award to China's Central Academy of Fine Arts.

from the government (National Development and Reform Commission, Ministry of Education, National Information Center, Beijing Productivity Center, and others), industry (more than 50 OEMs such as Audi, SAIC, GAC, BAIC, Ideal, BMW, Hyundai, Nissan, Volkswagen, CRRC), and institutions (Seoul Design Foundation, Strate School of Design). The department has established several subordinate laboratories, including the Artificial Intelligence and Design Innovation Lab with Peking University, the Intelligent Mobility Lab with Li Auto, and the Concept Next Design Lab with BMW Brilliance. Resource sharing, information sharing, and student and faculty exchange programs are accomplished by cooperating with more than 10 universities around the world. The department has formed a teaching and research method with mobility as the basis and innovation as the purpose.

The mobility innovation design department is committed to building an open teaching platform integrating social, technological, industrial, commercial, and ethical motives to create a teaching system and a progressive teaching approach. The core of the curriculum is the research-based courses grounded in industry-academy cooperation, which is supported by basic skills courses, emerging technology courses, and immersive experience courses. In order to emphasize dynamic practice and innovation-driven instructional activities, the faculty composition is very open, with designers and innovators from the industry as well as international lecturers participating at the same time. Future mobility serves as the starting point for the curriculum, which then helps students in overcoming the limitations of the traditional industrial design mindset through interdisciplinary research and design skills, analyzing the opportunities and challenges brought by

emerging technologies, and outputting diverse solutions for future mobility scenarios. It helps the students build a comprehensive system of explicit and tacit knowledge to deal with the changes and trends in design methods in the new context.

Today, China's automotive sector is firmly at the forefront of innovation for the world. Relying on the vast market, prosperous information technology industry, and innovative design education, mobility innovation design education in China is forming a localized education method and development paradigm.

### 3. Disciplinary Paradigm

Automotive design in the traditional sense has gone through four stages from the viewpoint of general trends in the design discipline. Automotive design is the first step that serves the industry, system design is the second stage that serves industry standards, mobility innovation design is the third stage that serves the people, and the ecological niche design of mobility is the fourth stage that serves society. The first two stages were the major content of the discipline in the 20<sup>th</sup> century, while the latter two represent the emerging reconfiguration of the discipline's direction since the beginning of the 21<sup>st</sup> century, along with the changing context of technological society and the iterating industry strategies.

In John Maeda's *Design In Tech Report* (2019), design is divided into "classical design" "design thinking" and "computational design".<sup>2</sup> Likewise, we can divide the context of mobility design into stages in chronological order from the perspective of information technology iteration, manufacturing technology development, and information storage and exchange carrier evolution. They are the components that stand out the most when emerging technologies interact with people and society, and these three factors were chosen for contextualization. They are also the main reasons for changes in the definition of design and the way of working. Production design, design of design, interface design, and computational design are the four stages of design context. The second context generates the discipline of automotive and transportation design, which was fully developed within disciplinary systems and methodologies. In the third context, the discipline's emphasis was upgraded to include study of the "new species" and "scene flow" of mobility. In the fourth stage, the automobile and artificial intelligence are tightly integrated, forming an essential connection between human, social, natural, and cyber systems. It has become crucial to study the "ecological niche" of behavior in mobility and its social roles. How to





construct a reasonable learning approach for students, and balance them among the four stages of context, is the main criterion in determining paradigm, methodology, and curriculum.

The disciplinary paradigm of mobility innovation design at CAFA is a teaching and research practice based on the context of an emerging technological society interwoven with the development of new energy

options, a sharing economy, the internet of things, and artificial intelligence, as well as in response to the ongoing changes in the properties of the automotive industry. The goal is to cultivate an intellectual group of young people with logical analysis, active innovation, technological sensitivity, and social concern to grow into future standard setters of the industry through sustainable design practices. The department closely

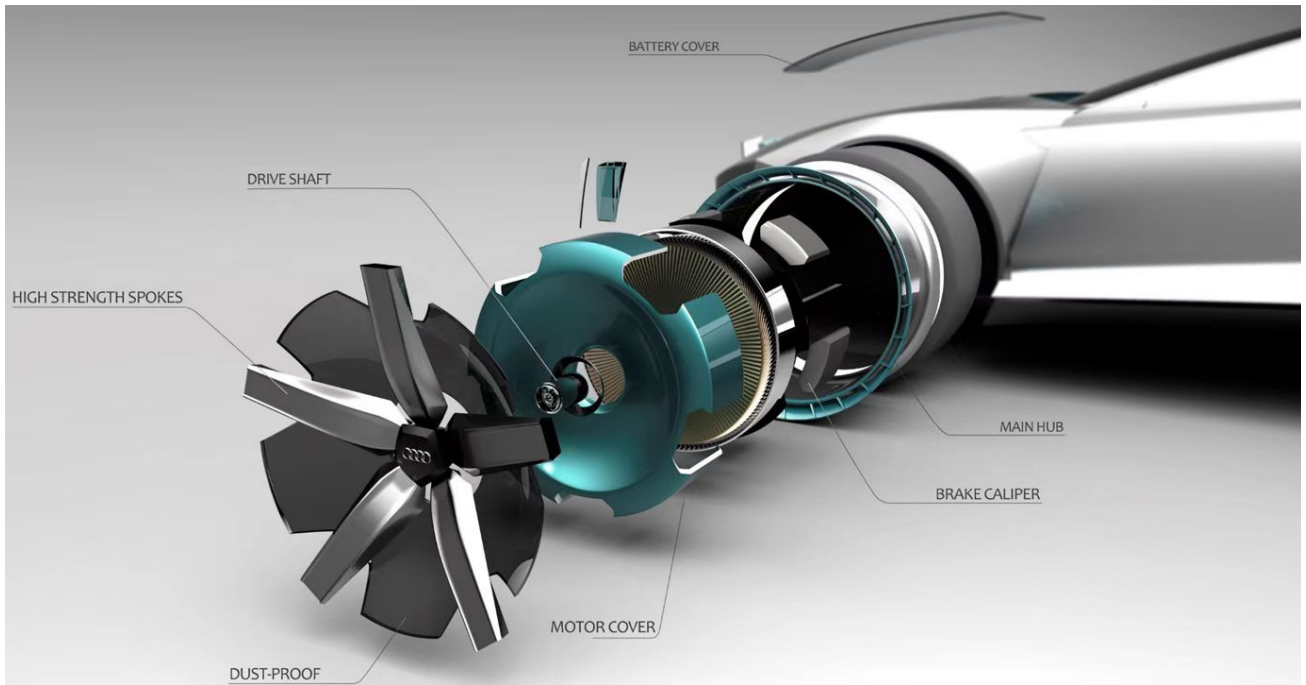


Figure 3,4,5. Na Jia & Xu Yixiong. Industry-Academy Cooperation Project between CAFA and Audi.

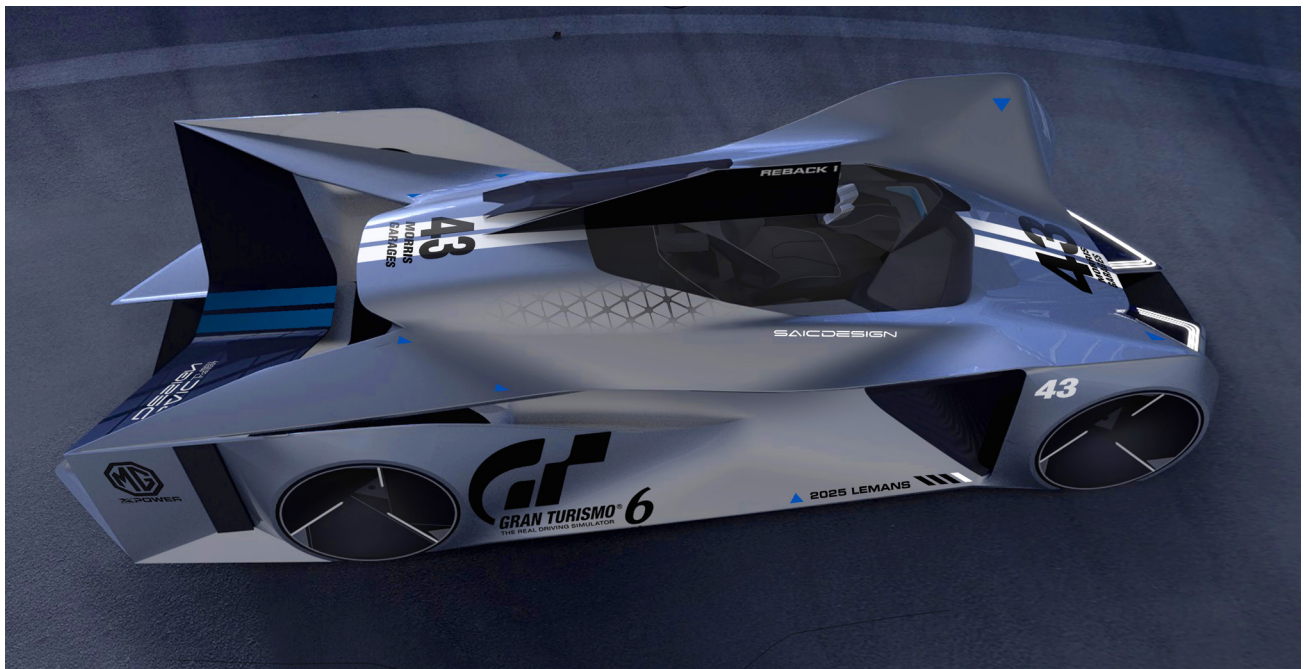


Figure 6. Li Jianing. Industry-Academy Cooperation Project between CAFA and SAIC.

follows national policies, focuses its teaching and research on the field of economic and social development areas, and actively contributes to the development of pillar industries and economic construction.

At present, the world's automotive industry and design education are both confronting "unprecedented changes of the century". Mobility innovation design has entered a new stage of development, with concepts, methods, and paradigms being constantly redefined, and

this will continue to be so for a long time. "Constant Adjustment to the knowledge structure is the only way to ensure the ability to solve specific problems."<sup>33</sup> The mobility innovation design education of CAFA will remain "undefined" for a long time, adapting to the changes of the times and education.

*Mobility Innovation Design Education at China Central Academy of Fine Arts*

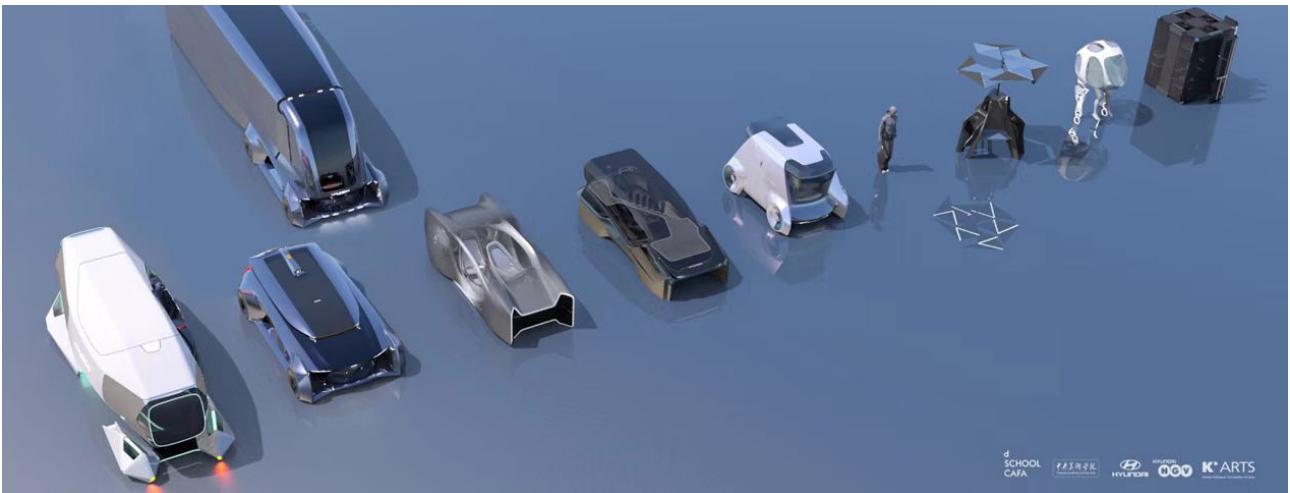


Figure 7. Xu Tianshi. Industry-Academy Cooperation Project between CAFA and BMW.

Figure 8. Industry-Academy Cooperation Project between CAFA and Hyundai.

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### ENDNOTES

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## 待定義的出行創新設計：概念、邏輯與範式

王選政，王倩男

**摘要：**為服務正在起步發展階段的國家支柱產業，以設計教育進行助力，中央美術學院從 2006 年開始建立出行創新設計教育，致力於建構中國式的出行創新設計教育標準，並探討全球產業語境下出行創新設計教育在中國的標準。在“汽車設計”到“交通工具設計”，再到“出行創新設計”的不同學科發展階段，以及“生產的設計”“設計的設計”“介面的設計”和“計算的設計”的語境變化下，出行創新設計教育依託產教融合的教學邏輯，形成兼具全球化屬性和中國在地性的教學邏輯和發展範式，以“待定義”的姿態回應時代之變和教育之變。

**關鍵字：**出行創新設計；教學模式；產學合作