

# **Macao Funding Scheme for Key R & D Projects 2023**

## **Digital Technology**

### **Application Guideline for Projects of Intelligent Human Computer Interaction**

#### **I. Background**

The new generation of artificial intelligence is the driving force for promoting technological cross-area development, industrial optimization and upgrading, and overall productivity leap. Human-computer interaction technology is directly related to economic development, which is a technological threshold for integrating information technology into society, penetrating into groups, and achieving widespread application. Moreover, it is a hot research direction in artificial intelligence technology. The “14th Five Year Plan” for Software and Information Technology Service Industry Development Planning issued in 2021 proposed to “accelerate the development of new machine learning, biometric recognition, natural-language comprehension, new human-computer interaction, intelligent control and decision-making and other products and services”.

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The high-tech industry is a key development focus proposed by the Macao SAR Government in its Policy Address for the Fiscal Year 2023. Artificial intelligence is a key industry development area clearly identified in the “Second Five-Year Plan for Economic and Social Development of the Macao Special Administrative Region (2021-2025)”. Macao has a certain R&D foundation in the field of intelligent human computer interaction, and conducting research on its cutting-edge technologies and application scenarios to achieve more efficient and natural

intelligent interaction, while bringing convenience to life, is crucial for promoting the development of Macao's technology industry.

In order to leverage Macao's strength in intelligent human computer interaction, further integrate existing advantaged resources, and upgrade its R&D capability and industrialization level, the Macao Science and Technology Development Fund (FDCT), based on soliciting opinions of scientific researchers in relevant fields in Macao, and relying on the strength of Mainland experts, researched and proposed this key R&D project on intelligent human computer interaction, meeting the needs of China and leveraging Macao's strength in a planned and step-by-step manner. Through various scientific and technological monitoring technologies, Macao's moderate economic diversification and the development of the Guangdong-Macao In-depth Cooperation Zone in Hengqin could be better facilitated, assisting in the construction of an international innovation and technology hub in the Guangdong-Hong Kong-Macao Greater Bay Area and thereby contributing to the building of China into a new country.

## II. Overall Objectives

To carry out cutting-edge research and high-end platform R&D of intelligent human computer interaction technology, with a focus on Macao's urgent needs for human computer interaction

technology in the fields of culture, tourism, education, and others. To develop a Metaverse system oriented to typical application scenarios, improve Macao's scientific and technological innovation capability, and promote the wide application of artificial intelligence technology in Macao's economic and social development, through innovative design of human computer interaction mode and key technology research.

### III. Research Field

**Research Field:** To carry out R&D of key technologies and systems of Metaverse with multimodal human computer interaction capability for culture, tourism, education and other application scenarios.

To study lightweight context accurate perception technology, high-performance neural network rendering technology, human-computer-environment multimodal natural interaction intention comprehension, and lightweight implementation technology based on big language models, and develop a Metaverse system for typical application scenarios.

**Performance Indicators:** Developing a set of original system of Metaverse, in which its technical indicators should fulfill the followings:

- (1) The accuracy of interaction and intention comprehensive

shall not be less than 95%.

(2) No less than three modes of perception are available.

(3) The rendering performance of the neural network shall not be less than 20 frames per second.

(4) Can be presented on mainstream mobile terminals such as smartphones, tablets, VR/AR wearable display devices, etc.

(5) Verified in no less than 1 typical application scenario

\* The above performance indicators (1) – (3) must be certified by a recognized third-party test.

#### IV. Application Requirements

(1) The applying entity shall file the application in the form of a project with the research topics of the research field listed in this Guideline. Unless otherwise specified, a project should include no more than 3 topics.

(2) Each project should be submitted for the application as a whole, and all the research contents and performance indicators must be covered.

(3) The lead unit shall be a Macao entity, Macao and Hengqin enterprises are welcome to participate in cooperation. The number of participating units for each project shall not exceed 6.

- (4) Every project leader or topic leader(s) must be qualified to work full-time in Macao.
- (5) Projects must be led or participated by enterprises, which shall provide supporting funds of no less than 50% of the fund. A formal cooperation agreement shall be provided if the project is collaborative.
- (6) The implementation period of the project is 3 years. The maximum application amount for each project is MOP 15 million.

#### V. Experts Involved in the Formulation of the Guideline

Huang Panfeng	Professor of Northwestern Polytechnical University
Liu Xiaofeng	Professor of Hohai University
Rao Peilun	Professor of Tsinghua University
Shi Yuanchun	Professor of Qinghai University
Zhou Kun	Professor of Zhejiang University