Huawei's View on Metaverse
華為怎樣看元宇宙？

Dr. Zeng Jia 曾嘉博士

Director of the AI Strategy Planning & Cooperation Department,
Noah's Ark Lab Huawei

華為諾亞方舟實驗室—戰略規劃部長

Interviewed by: Mr. Tony Hau
採訪者：侯東迎先生

Huawei is a technology company, we believe that the essence of the Metaverse is merging our real and digital lives. Model is the connection between physical and digital world. With 3D modeling and simulation technology, it is possible to find optimization solutions for the physical world in the digital world. For example, training autopilot in simulated environment, smart factories with simulation technologies, and smart cities with digital twin solutions.

華為是一個科技公司，我們認為元宇宙本質是融合，意味着物理世界和這個數字世界的融合。模型是數字世界與物理世界連接的橋樑，通過對物理世界建模，將物理世界數字化。通過 3D 建模仿真、數字孿生，有可能在數字世界找到物理世界的優化方案。比如未來自動駕駛的仿真訓練，智能工廠的仿真化以及智慧城市的數字孿生等。

Use case 1: Industry 4.0

With the development of Industry 4.0 and the Internet of Things (IoT), digital twins have also become a hot technology. In the process of continuous evolution of cities, from digitalization to intelligence, digital twins plays an important role to pushing towards smart cities. Digital twins combined with Huawei's industrial intelligence, relying on big data analysis, can provide a full-chain intelligent service for design, production, logistics, sales, and service, and help enterprises build leading advantages with new technologies through analysis and mining of data value.

場景 1：數字孿生（工業 4.0）

隨着工業 4.0 與物聯網的發展，數字孿生也成為了時下的技術熱點。在城市不斷進化的過程中，從數字化到智能化再到智慧化，數字孿生是通往智慧城市的一個重要技術路徑。數字孿生結合華為工業智能體，依託大數據分析，可以提供設計、生產、物流、銷售、服務全鏈式智能服務，通過分析、挖掘數據價值，助力企業藉助新技術構築領先優勢。

Use case 2: Autopilot Simulation

In the field of autonomous driving, by constructing a virtual world as realistically as possible so that Autopilot could smoothly transfer its learnings from the simulation to the real world.

It provides a safe environment for the training and verification of autopilot algorithms. On one hand, it reduces the cost of data collection and annotation, which speed up the training of autopilot models. On the other hand, it can cover more corner cases (such as extreme weather conditions such as heavy rain, snow and fog etc.) in the training set, so that autonomous driving vehicles can safely deal with more complex scenarios in the real world.

Use case 3: 3D Virtual Showroom

The impact of the global pandemic of COVID-19 has accelerated the process of digitization. In real life, offline gatherings (such as conferences, concerts, etc.) have been moved to digital and virtual world. Taking shopping as an example, the emerging 3D e-commerce platforms use Augmented Reality (AR) and Virtual Reality (VR) 3D models to enable customers to "seeing, trying, and wearing" in the virtual space. With such a better user experience, the user conversion rate is highly improved.

場景 2：自動駕駛仿真

在自動駕駛領域，通過構建一個真實世界的虛擬仿真空間，為規控算法的訓練和驗證提供了一個安全的環境。一方面降低數據採集和標註的成本，加速自動駕駛算法的訓練。另一方面能覆蓋更多難例場景（例如高速公路路面異物、雨雪霧等惡劣天氣、行人或車輛未按交通規則運行的異常軌跡等），使我們的算法能夠安全應對更多複雜場景。

場景 3：3D 虛擬展廳

全球疫情的影響加速了數字化的進程。現實生活中線下的大型聚集活動如發布會、演唱會等都搬到了線上虛擬場景。以電商場景為例，相較 2D 的商品展示，3D 的展示可以給用戶帶來更好的體驗，通過 "看、試、穿、戴" 等模擬方式提升用戶轉化。
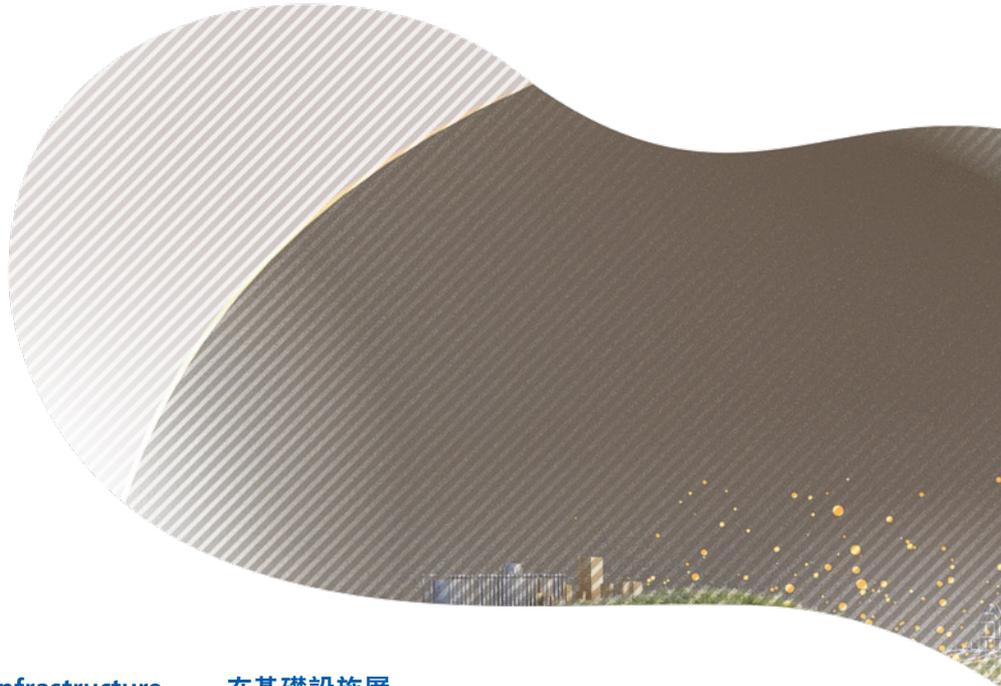
Huawei's business opportunities in Metaverse

The metaverse involves a multi-technology stack, including infrastructure, terminal, computation layer, application platform, content platform etc. Huawei mainly focuses on ICT infrastructure, cloud and smart terminals.

華為元宇宙技術布局

元宇宙可能涉及到 7 層模型，包括基礎設施層、終端層、去中心化服務層、空間計算、創作平台層、應用平台和內容應用平台，還有內容。華為主要圍繞着我們長期聚焦的 ICT 基礎設施，雲和智能終端，做出我們作為一個公司能夠做出的貢獻。

Communication and Computation Infrastructure

On one side, the digital world and the physical world need to be fully integrated, which leads to a strong requirements on real-time interaction, i.e. upstream and downstream bandwidth. On the other side, rendering in digital world requires great computing power. Huawei is the leading technology supplier for communication and computation.

在基礎設施層

需要數字世界和物理世界充分融合，對實時交互的時延、通信上下行的帶寬都會提出更高要求，渲染也需要更大的算力，需要把聯接和計算進行有機結合。

Smart Terminals

Recent years, Huawei invested highly in research and development in smart terminals, such as mobile phones, glasses, wearable devices and many others. For example, we made greater success in XR hardware and 3D spatial video solutions have made great progress.

Application Platform

Based on HUAWEI CLOUD for planning and layout, and based on Meta Studio to build a digital content production line, we will continue to create more creative content for the digital world.

終端層

華為主要在手機、眼鏡、穿戴設備等多個方面進行研發和投入。比如 XR 硬件、3D 空間視頻解決方案取得很大進展。

應用和創作平台

基於華為雲進行規劃和布局，基於 Meta Studio 構建數字內容生產線，為數字世界源源不斷創造更有創意的內容。