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AR Engine : Geometry AI as foundation of digital world

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Zou, Wenjin

Huawei Handset Product Line, AR Product Executive

. Zou, Wenjin served as Product Executive of Huawei AR program. He initiated many innovation programs during last 20 years on smartphones, tablets, chips and OS. He worked for Intel over 10 years as chip platform product managers and lead Qualcomm's ecosystem engineering team before joining Huawei.

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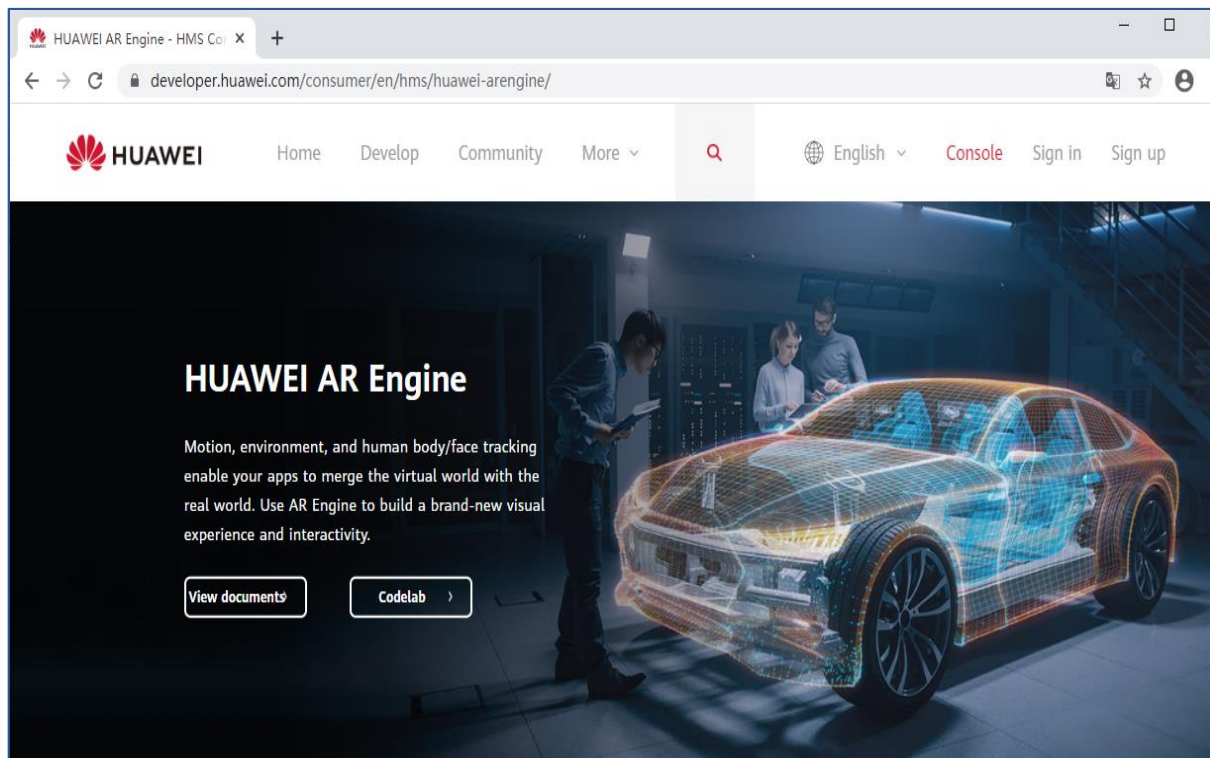


PART 01

HUAWEI AR Engine Introduction

Vision of HUAWEI AR Engine

Breaking Through the Boundary of Imagination and Facilitating All-Scenario Digitalization



➤ Leading AR technologies:

HUAWEI AR Engine accurately understands the motion, environment, human body, and face to form a human-centered digital foundation.

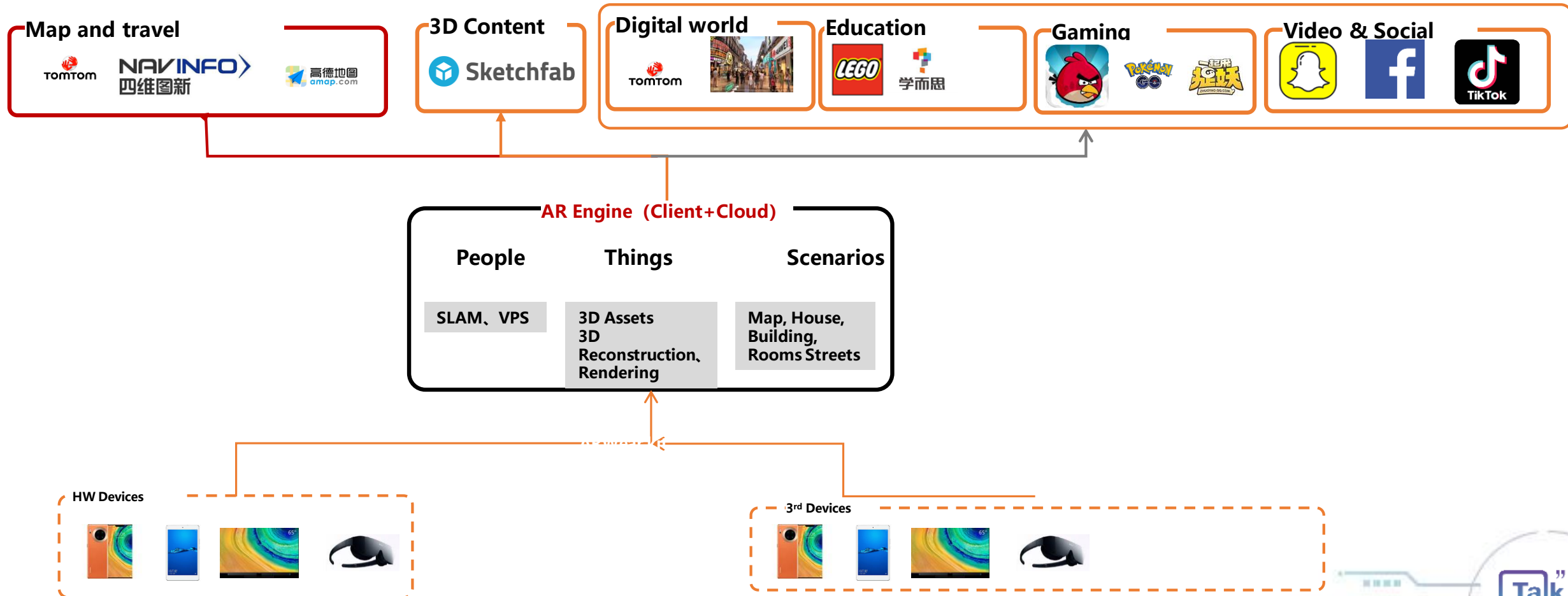
➤ Abundant application scenarios:

HUAWEI AR Engine provides a people-oriented full-scenario service and a basic platform for virtual-physical convergence.



AR Engine: Naturally and Accurately Integrating Digital things to Physical World seamless and imaginary way

- State of Art AR technology: AR Engine understand motion, environment, human body and face with precise geometry intelligence
- Rich use cases: AR Engine provide full digitization capability for people centric scenarios



Leading AR Platform, support 200+ millions devices



HUAWEI AR Engine

Precise and Stable

- SLAM precisely in cm
- Real time 3D Reconstruction in mm
- Image and 3D tracking
- People Digitization



App and Ecosystem

Life & Entertainment

- App: AR Measurement, MagicView, 3D Scanner, Huawei AR Map、Remote Assistant
- Ecosystem: JD, Tencent Wizard



3D contents Vector

Cloud AR

- Share, One stop solution



Tools Reality Studio

10 time efficiency

- One stop development
- Zero coding
- Scenarios orientated

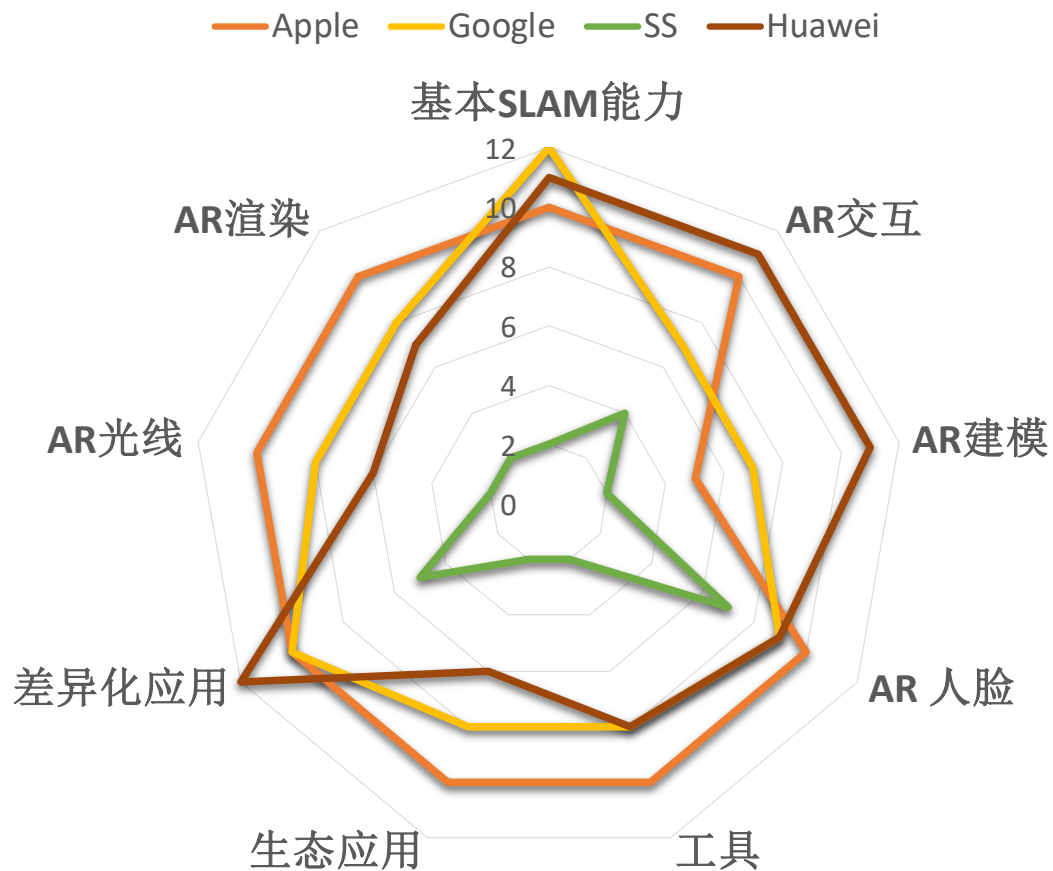
together, Perfect Game

1. 支持华为旗舰机，高端终端机型包括 P30 系列，Mate20 系列，Nova 系列，荣耀系列，麦芒系列，华为平板 M6 等设备
2. 1.0 倍效率提升根据华为产品开发实例与友商数据获得。



Richer AR feature set, State of Art AR capability

AR Benchmark



Feature		Huawei AR Engine	A 3.5
Motion	SLAM	RGB+ToF, RGB	RGB/ToF
	Anchor	Cloud + Client	Client
Environment	Real time 3D Reconstruction	Y (RGB+ToF)	-
	Semantic	Y	Y
	Image Tracking	Cloud + Client	Client
	3D tracking	Cloud + Client	Client
Body, Face and Hand	Face AR	4K	Y
	Body Skelton	23	17
	Body Mask	Y, Real time, low power	Y
	Body Shape	Y	-
	Hand Skelton	Y	-

Leading 3D Scanner, Powered by Huawei AR Engine

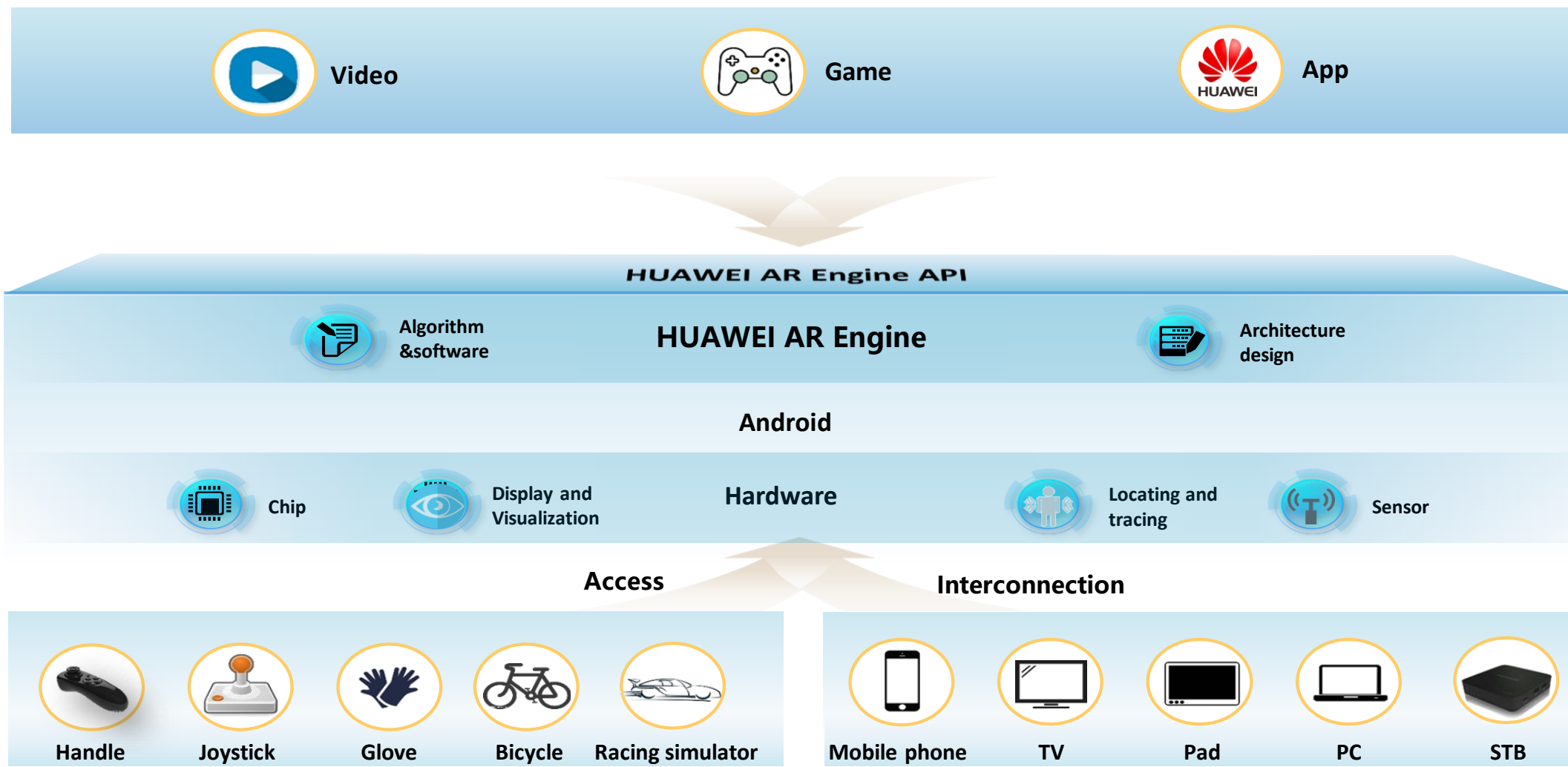
Demo



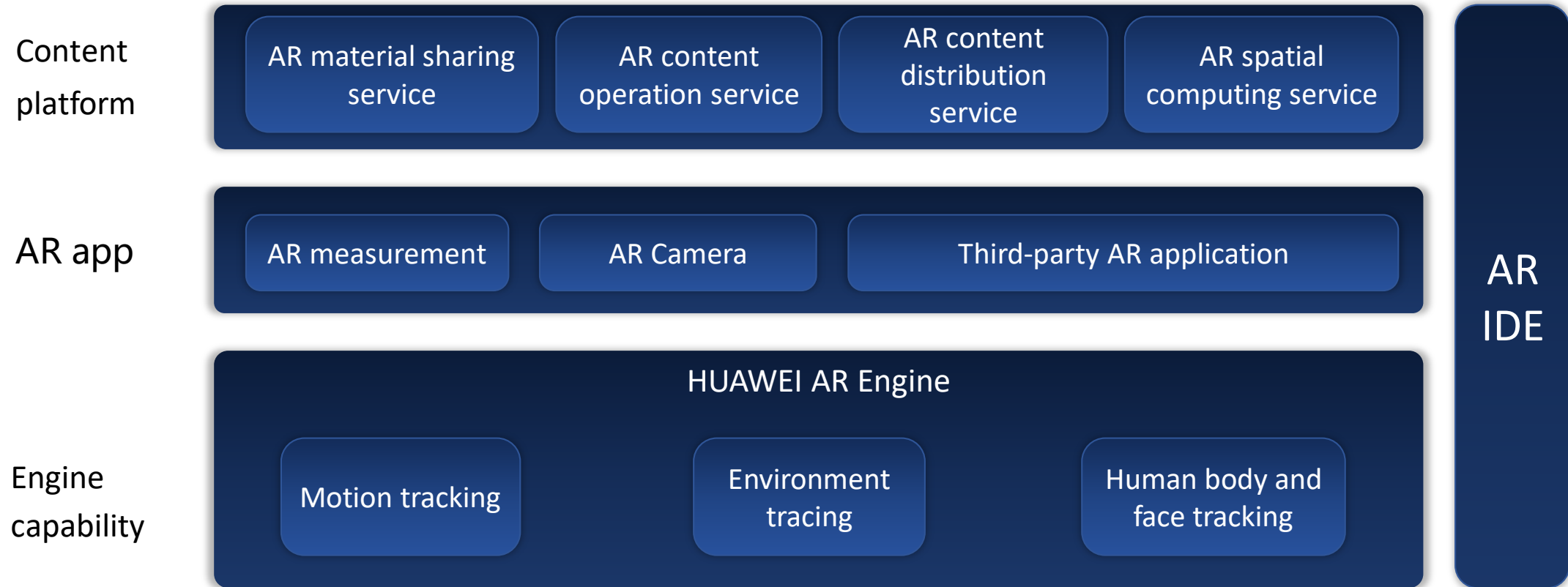
Mate 20 global launch event in London



HUAWEI AR Engine is an AR Engine Sculpted by HUAWEI



Architecture of HUAWEI AR Engine



HUAWEI AR Engine is the cornerstone of Huawei AR and provides precise virtual-real integration capabilities.



HUAWEI AR Engine Advantages

• Stable, Accurate SLAM and leading Capability

- HUAWEI AR Engine integrates modules, chips, algorithms, and EMUI systems, and uses hardware acceleration to provide better AR capabilities with lower power consumption.

• Rich Capabilities:

- Based on the unique hardware of Huawei mobile phones, Huawei mobile phones also provide interaction capabilities such as face, gesture, and body recognition, and more than 240 APIs, in addition to the basic motion tracking and environment tracking capabilities.

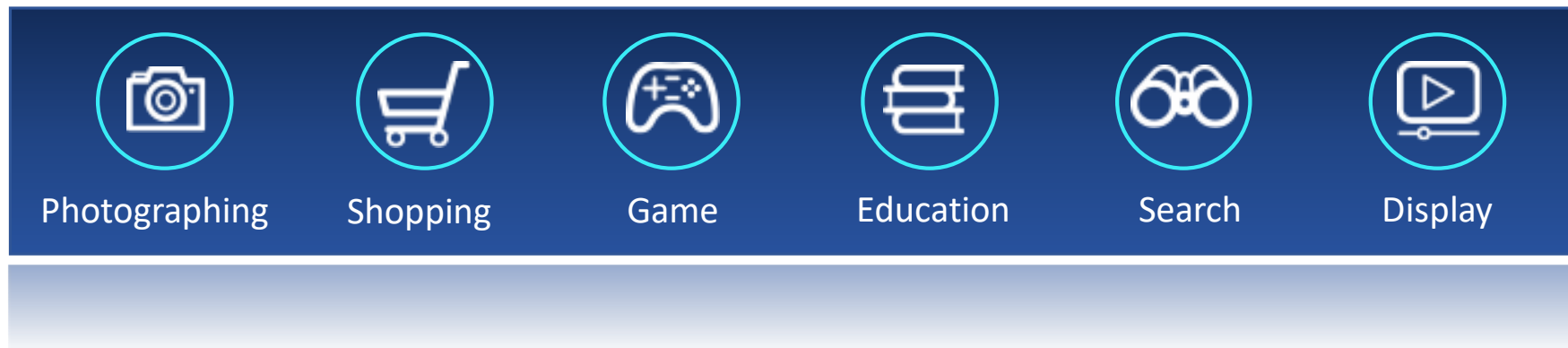
• Support for a hundreds of millions of devices:

- With a large number of Huawei mobile phone users, developers can connect HUAWEI AR Engine to various Huawei mobile phones and support more than most main stream Huawei phones and tablets.



HUAWEI AR Engine Application Scenarios

- Typical application scenarios: AR photographing, AR shopping, AR game, AR education, AR search, and AR display.





PART 02

HUAWEI AR Engine Functionalities

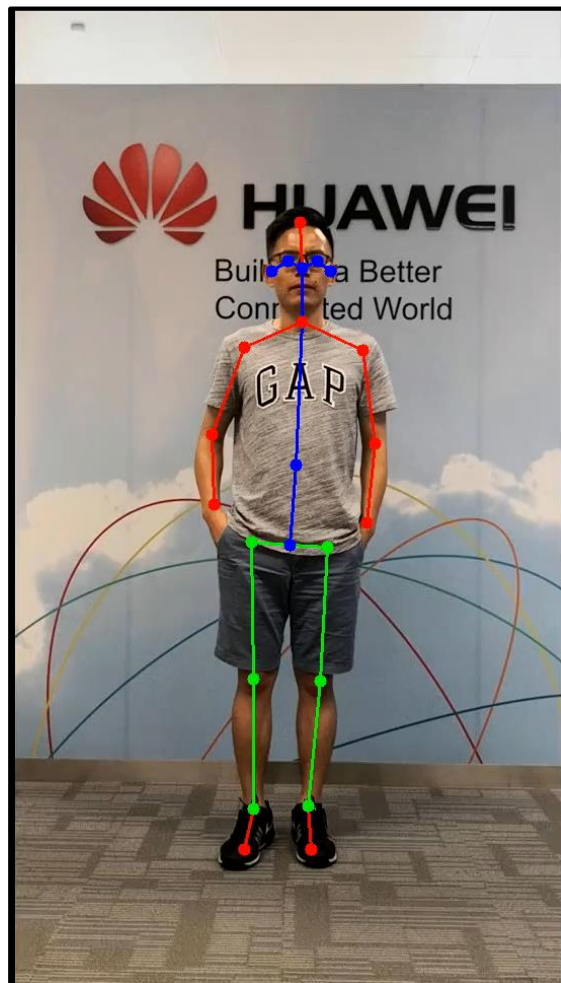
HUAWEI AR Engine: Leading SLAM capabilities



- **Motion tracking:** Continuously and stably tracks changes in the position and posture of the mobile phone, and simultaneously outputs three-dimensional coordinate information relative to the surrounding environment.
- **Plane detection:** Enables the phone to detect the size and position of horizontal and vertical planes (such as ground and walls).


- **Light estimation:** Enables the phone to estimate the lighting conditions of the surrounding environment. Currently, this feature only supports the estimation of ambient light intensity.
- **Hit testing:** Enables you to select points of interest in real-life environments through your phone screen.

HUAWEI AR Engine: Leading body digitization




- **Human body pose recognition:** Identifies specific human body postures.
- **Human body skeleton tracking:** Identifies and tracks the positions and postures of 23 human body skeleton points to form a human skeleton diagram. This function supports single persons and multiple persons.
- **Hand gesture recognition:** Recognizes specific hand gestures and actions.

HUAWEI AR Engine: Leading Face AR capabilities



Alg FPS: 26.61
Render Scale: 0.41
Alg Scale: -0.2457
Lib Version: S7001010800
Model Version: M7001010800
Apk Version: A1906130736



- **Facial expression tracking:** Real-time calculation of the parameter values corresponding to each expression of the face can be used to directly control the expression of the avatar.
- **Face mesh:** The Mesh model data of the face is calculated in real time, and the Mesh model data follows the face change and motion in real time.



PART 03

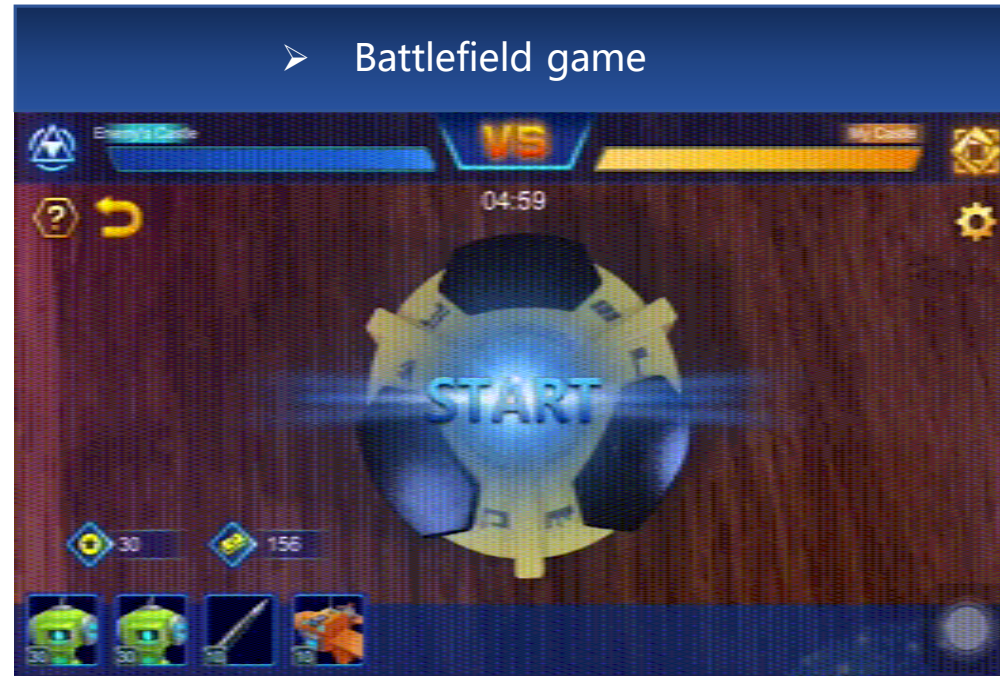
HUAWEI AR Engine Business Value

HUAWEI AR Engine Enhances Game Interaction

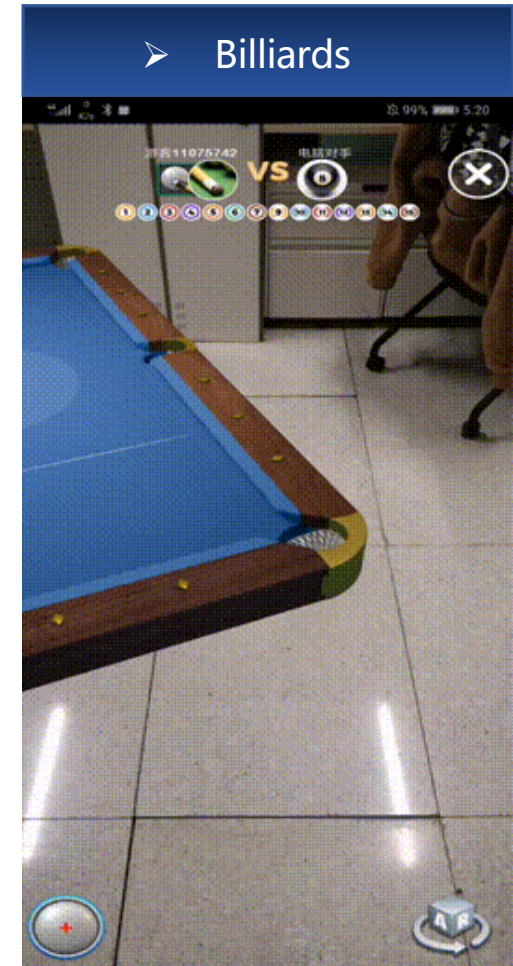
➤ The World of Magic



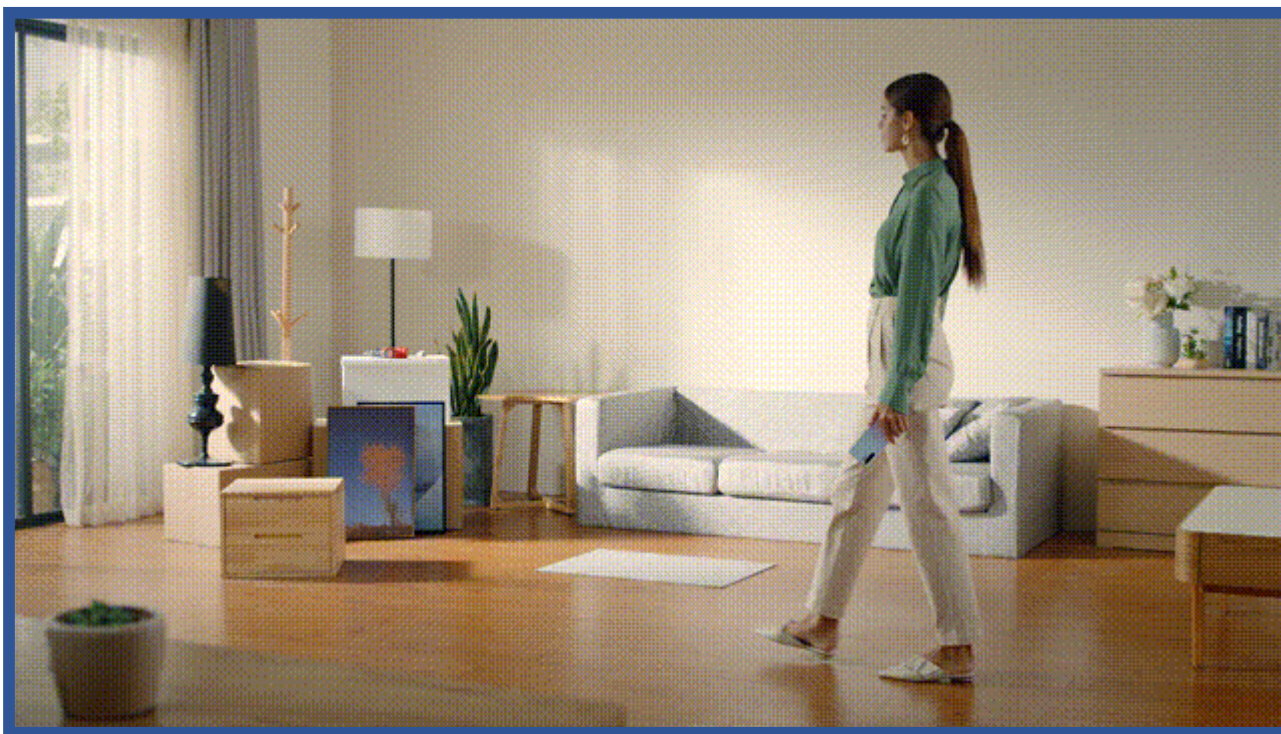
➤ Battlefield game



➤ Billiards



HUAWEI AR Engine Improves the Way Of Obtaining Information

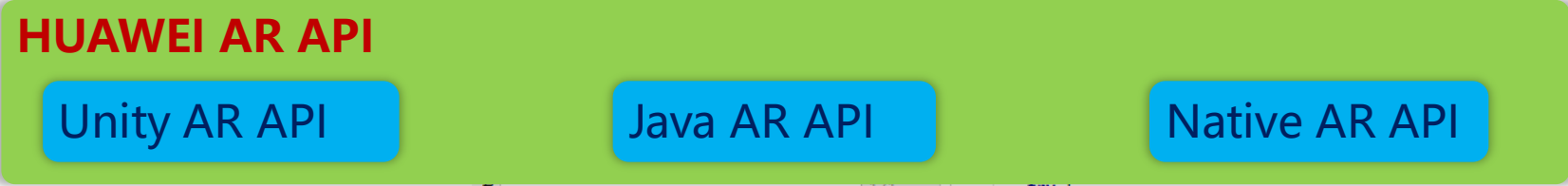


- AR measurement
- AR walking navigation
- AR-aided design
- AR-aided construction

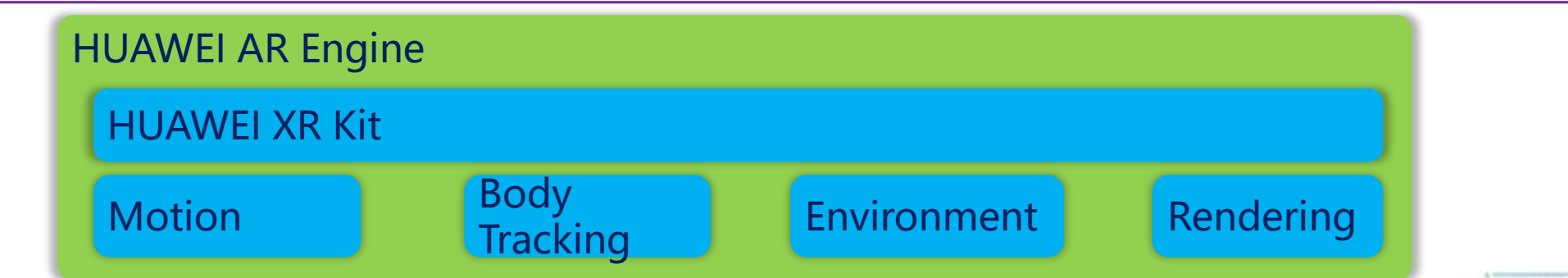
Huawei AR Engine: Simple API, Rich function, Easy to Integrate & Port

```
150 }
151 mArSession = new ARSession(this);
152 ARWorldTrackingConfig config = new ARWorldTrackingConfig(mArSession);
153
154
155 int supportedSemanticMode = mArSession.getSupportedSemanticMode();
156 Log.d(TAG, "supportedSemanticMode:" + supportedSemanticMode);
157 if (supportedSemanticMode != ARWorldTrackingConfig.SEMANTIC_NONE) {
158     Log.d(TAG, "supported mode:" + supportedSemanticMode);
159     config.setSemanticMode(supportedSemanticMode);
160 }
161 mArSession.configure(config);
162 mRenderUtil.setArSession(mArSession);
163 } catch (Exception capturedException) {
164     exception = capturedException;
165     setErrorMessage(capturedException);
166 }
```

API



AR Engine



HUAWEI AR Engine Improves Shopping Experience



- Size matching
- Color matching
- Improved trial usage efficiency
- Higher purchase rate
- Reduced return rate

Furniture shopping: Improves shopping experience by putting furniture in actual use scenarios to see if the product size, color, and style are satisfactory. Leading e-commerce player JD integrated AR Engine.

AR Engine Case Study: JD AR Show, Improving Ordering Ratio



Leading Technology
Accurate, Stable & Natural

Fast Plane Detection
Easy to integrate

Business Values

DAU: > **1,000,000** AR user

Time On Page: **70%+**

Ordering Ratio: **40%+ (Makeup)** 、
25% (3C)



Cool Leading Games powered by Huawei AR Engine



Wizard together: AR photo

SLAM



YuMeng, AR Photo

SLAM

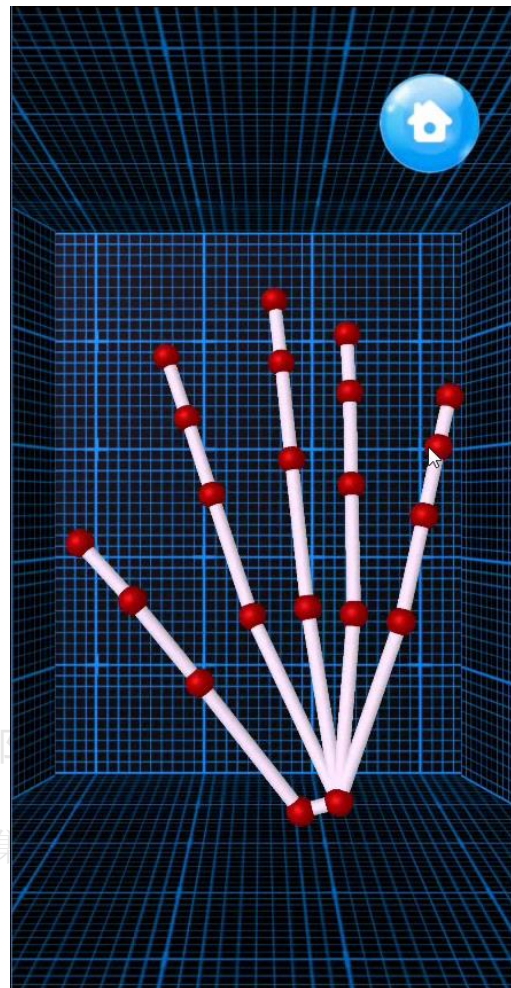


Swan, Avatar, AR photo

FaceAR

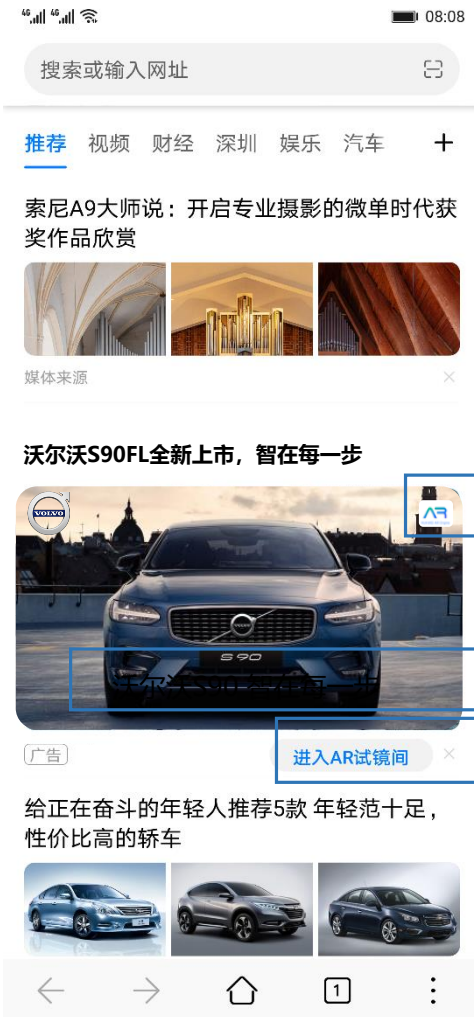


AR Games: Natural Interactions



AR Ads with Volvo, powered by AR Engine

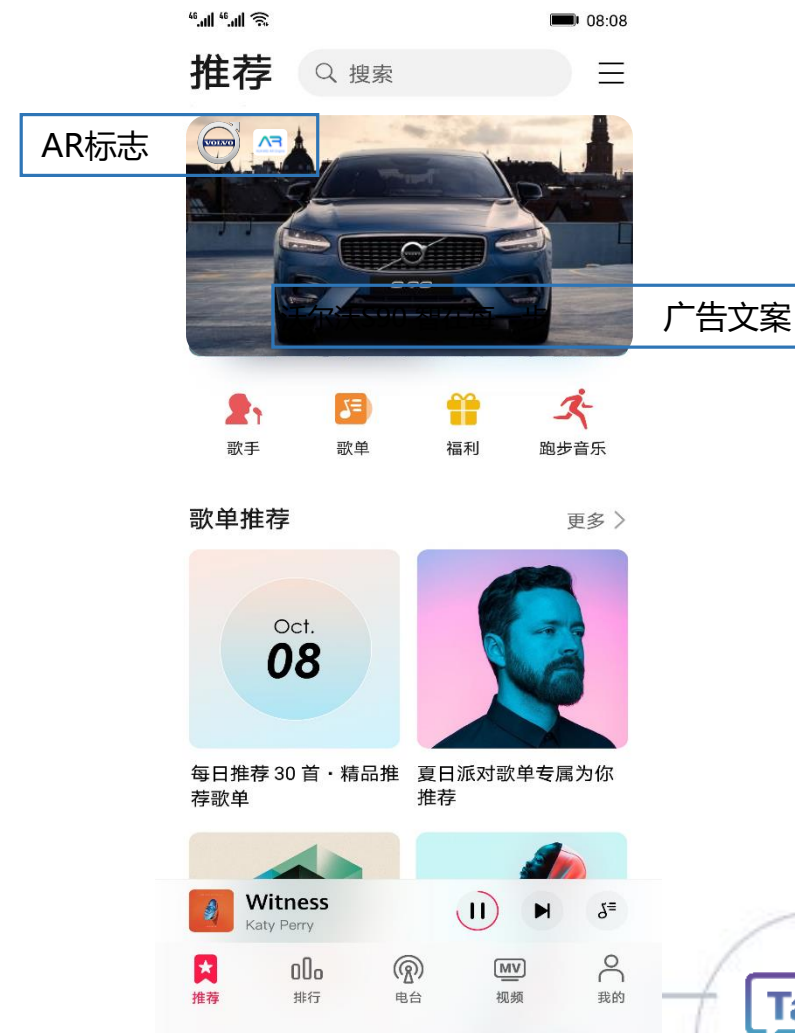
Feed AR



AR Flash



H5 AR



沃尔沃全新S60



AR 实车

发现沃尔沃全新S60的秘密



AR

即刻体验沃尔沃全新S60



VR 赏车

沉浸式赏车体验



VR

即刻体验沃尔沃全新S60



130 KM/H PILOT ASSIST 领航辅助系统
车速130km/h以内可实现
主动前行辅助转向

60 KM/H CITY SAFETY 城市安全系统
车速130km/h以内可实现
主动前行辅助转向

HUAWEI ARVR x SIXECO

华为公司提供ARVR Engine技术引擎；SIXECO六感科技作为华为ARVR汽车行业解决方案官方合作伙伴
提供汽车销售展示技术应用Neco Launcher及凌驾风云汽车游戏化应用汽车，为本次发布会提供相关的汽车内容设计，数据处理，技术服务

车高 1437 MM

车宽 1850 MM

轴距 2872 MM

车长 4761 MM

整车尺寸



概览



安全



性能



驾驶

PRIMA 5.0 V7i 3.0TL

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THANK YOU
