New paradigm of eXtended Reality
Breaking Digital and Physical barriers: from Lab to World to deploy Personalized products and services *for ALL*

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eXtended Reality (XR) encompasses the previous terms of Virtual Reality (VR), Augmented Reality (AR), and Mixed Reality (MR). Although significant efforts have been made over the past decades, many developments have failed. However, it now appears that we are amidst a hype. To avoid repeating past mistakes and to **overcome previous barriers**, it is necessary to move beyond prior approaches, providing mainstream applications and functionalities that are useful and easy to use. XR applications should not only cater to a limited segment of the population but should strive to **reach 99% of the population**, thereby enhancing inclusion and societal acceptance. The reduction of technology costs, the proliferation of the Internet of Things, the deployment of 5G, and the increase in digital literacy can fuel the growth of XR to **deploy mainstream products and services for ALL populations.**

Human Global Model

Towards a **human** centered world

This **moonshot to democratize XR** leans on:

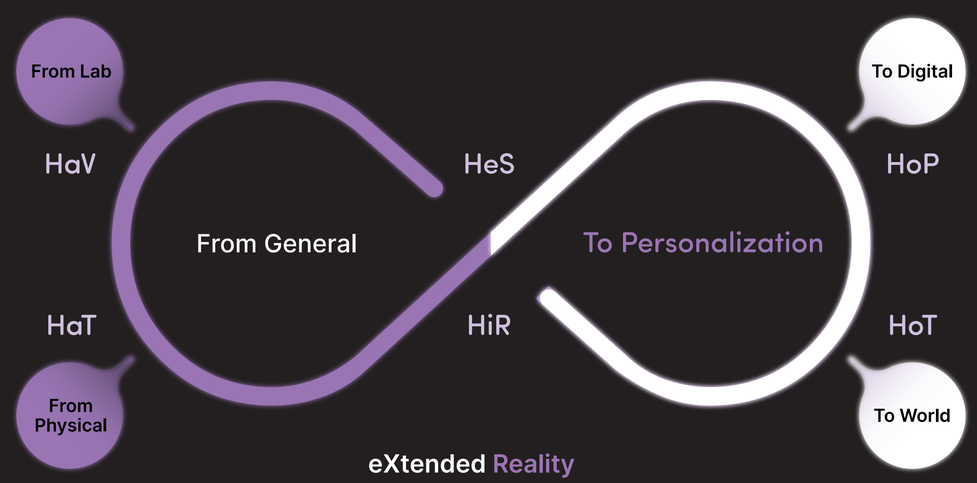
01.
Digital Twins of the World and personalized **Digital Human Modelling (DHM)** that derives in long term to digital human twins.

02.
Low cost and non-obtrusive technology that allows us to move our systems from lab to world in a seamless way.

03.
Functional, secure, friendly and inclusive real **applications to augment human capabilities,** provide new ways of interaction with technology and have a clear impact on the whole society.

To achieve this, we have connected **High Tech Labs, HAV** (Human Autonomous Vehicle) or **HAT** (Human Augment Thermal response) among others; with **REAL WORLD MEASURES** based on non-contact tech or wearables, **HOT** (Human Operational Tests) and **HOP** (Human Optimal Performance).
This is a medium-long term strategy to continually increase Human Data Base, covering wide profiles of DHM (99% of population), **beyond basic ergonomics and biomechanics**, including body shape, movements, thermal response, sensorial capabilities, cognitive capabilities and emotional response in different contexts and environments.

Breaking **physical** and digital barriers



2006 — From physical, analog, lab and general

2016

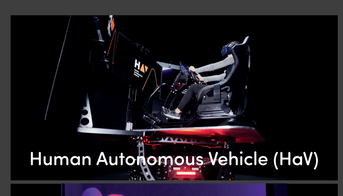
2025

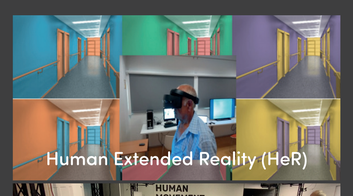
2030 — To mental, digital, world and personalised

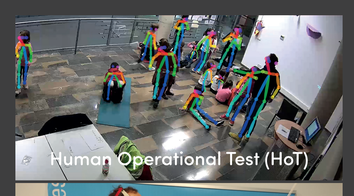
Ergonomics · Emotional response · Human error · Human factors · Robots collaboration · eXtended Reality · Biomechanics · Thermal control · Cognitive workload · Real time monitoring · Multiverse · Empathetic interaction

This holistic DHM combined with a **realistic and scalable digital world**, thanks to current digital resources, easy digitalization of environments and new AI and artificial vision algorithms, has allowed us to deploy new XR facilities: **Human Extended Reality (HeR)** and **Human Interaction Simulation (HiS)** Labs.

Closing the loop: **connecting Labs and World**







HiS and HeR mix physical and digital world and allow us to close the loop, with humans at the center, seeking benefits for society as a whole. During this demo, we will showcase several proof of concepts applied to **Health, Workplace, Mobility**, and other sector-specific applications of **mass products, services and environments for ALL.**

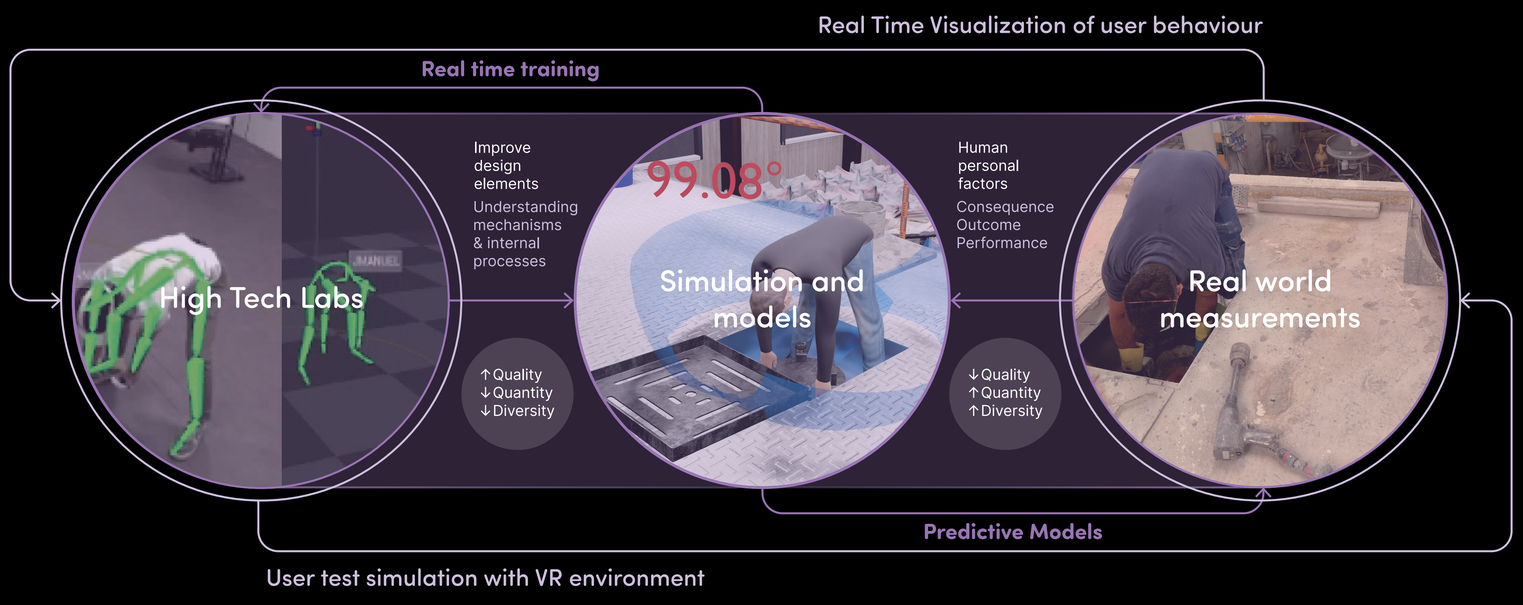
Long term **sinergies**

Determining causality — From personal and design factors to human peformance, understanding human behaviour, cognition & emotional mechanisms

Stage 1: Human Factors Labs

Stage 2: Simulation of environments and actions, to be installed anywhere

Stage 3: Real world implementation



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20 years understanding Human Interaction

Human FACTORS

Special thanks Arizona Vitoria and José Navarro (IBV; graphic design); all team members of Human Factors