

Welcome to The EVR@ platform

Virtual & Augmented Reality Environments



UNIVERSITÉ ÉVRY
PARIS-SACLAY

ibiSc



GENOPOLE

www.univ-evry.fr



Main goal

Mixed Reality Multimodal *assistance* to
humans for
Learning Motor, Mental or Group Skills

Motto: humans are at the center of the process
Link: IBISC IRA2 team research



A bit of history ...

- Inauguration in May 2004 [*F.Chavand, M.Mallem, S.Otmane*]
- Mixed Reality Platform
 - Semi-immersive 3,2m x 2,4m VR platform
 - Human Scale force feedback SPIDAR device (2009)
- Scientific project: ARITI (Augmented Reality Interface for Teleoperation via Internet), 1997-2013
- Scientific background: I3D selection/manipulation models, Follow-Me



Four groups of devices in 2024

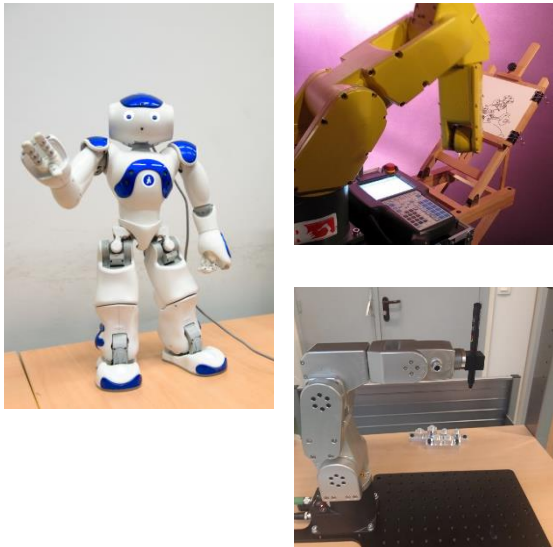


- Immersive Virtual Reality platform (EVR@-IM)
- Transportable devices (EVR@-TR)
 - VR headsets, force feedback devices, datagloves with controllers (HTC, Meta/Oculus)
 - Eye tracking VR headsets HTC
 - Tracking (infrared cameras, Leap Motion)
 - Xsens MTw AWINDA 3d kinematic device
 - Force feedback Phantom Omni 3dof and Haption Virtuose 6dof
 - Haptic jacket Skinetic
 - Datagloves Hi5 VR gloves, TactGlove bHaptics

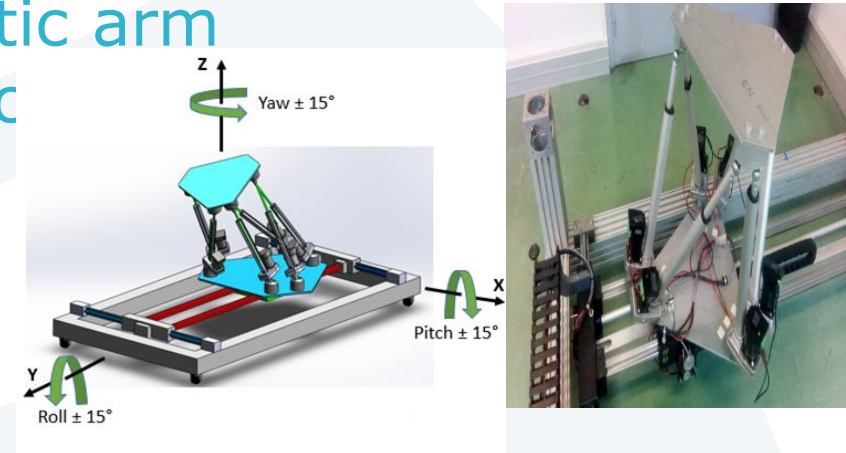
Four groups of devices



- Augmented Reality devices (EVR@-WE)
 - Microsoft HoloLens 2, META Quest3
 - Tobii Pro glasses 2



- Robotic devices and platform (EVR@-RO)
 - 2 NAO humanoïd robots (Aldebaran)
 - 1 FANUC LRMate 200iB robotic arm
 - 1 FANUC LRMate 200i robotic arm
 - 1 MECA 500 robotic arm
 - 1 8dof robotic system created at UFR-ST Univ. Evry



EVR@ at a glance (2003-2025)



FUNDINGS: 1,0 M€ invested for VR/AR/Robot devices and software

3 EU projects

7 ANR projects

9 Genopole/UEVE/IDF/Dept projects

5 ANRT CIFRE & Industrial projects

IBISC annual dotation (5k€/year)



PUBLICATIONS

34 Ph.D thesis

3 patents

63 articles in international journals

177 article in international
conferences



EVR@ devices
Web page



EVR@
YouTube



EVR@
Publications



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Main applications in E-Health



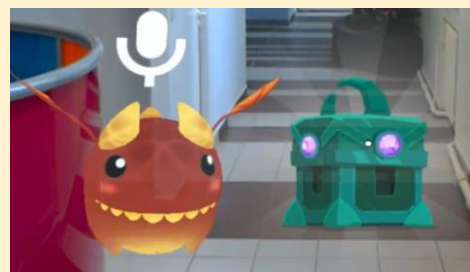
- ARROW-CP (2019-2026)
- The project aims to *create multimodal sensory feedback in mixed reality* for post-surgical gait rehabilitation **in children with cerebral palsy**.
- Partners: Ellen Poidatz foundation, e-health french company, French ANRT, SATT Paris-Saclay since 2024
- Project lead: PR Samir Otmane, Guillaume Bouyer for IBISC, Eric Desailly for E. Poidatz Foundation
- *Ph.D Anne-Laure Guinet (2019, Def 2022)*



Main applications in E-Health

Evr@ Platform: Arrow

Augmented reality gait rehabilitation for children with motor disorders



Description:

ARROW is an innovative solution using augmented reality and serious gaming to support a therapeutic protocol in a real-life environment. It is based on a user-centered design, an algorithm for detecting spatio-temporal gait parameters, a model and experiments on audio-visual feedback, and a clinical study. It increases patient adherence and commitment, session compliance and rehabilitation intensity.

Poster



Involved people

Samir OTMANE, PU IUT Évry
Guillaume BOUYER, MCF ENSIIE
Abbass BALLIT, Post-Doc IBISC

Associated
Article



Associated
Videos
(French spoken)



Main applications in E-Health



- VR&Co-VR Skills Lab (2017-2018)
- The project aims to study **the fidelity of interactions in virtual simulators** for learning technical and non-technical skills for surgical training and the collaboration in virtual simulators.
- Partners: CHSF hospital, Genopole and Region Idf (financial support), French ANR
- *Ph.D Aylen Rica-Cambon (2016-Def.2020)*



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Main applications in E-Health

EVR@ platform – ANR Showme project, 2021-2025

Show-me: Learning a technical gesture in virtual reality with multimodal feedback from a remote expert



Description

This demonstration illustrates our work on the design of companion learning systems in immersive virtual reality as part of the ANR Show-me project. We present a virtual environment for training a novice to perform a technical gesture through multimodal corrections (visual and haptic) provided by an expert (co-located or remote). This research is applied to the field of medical training.

Involved people

Amine CHELLALI, MCF Univ. Evry

Flavien LEBRUN, Postdoc IBISC

Cassandre SIMON, PhD Def 2024

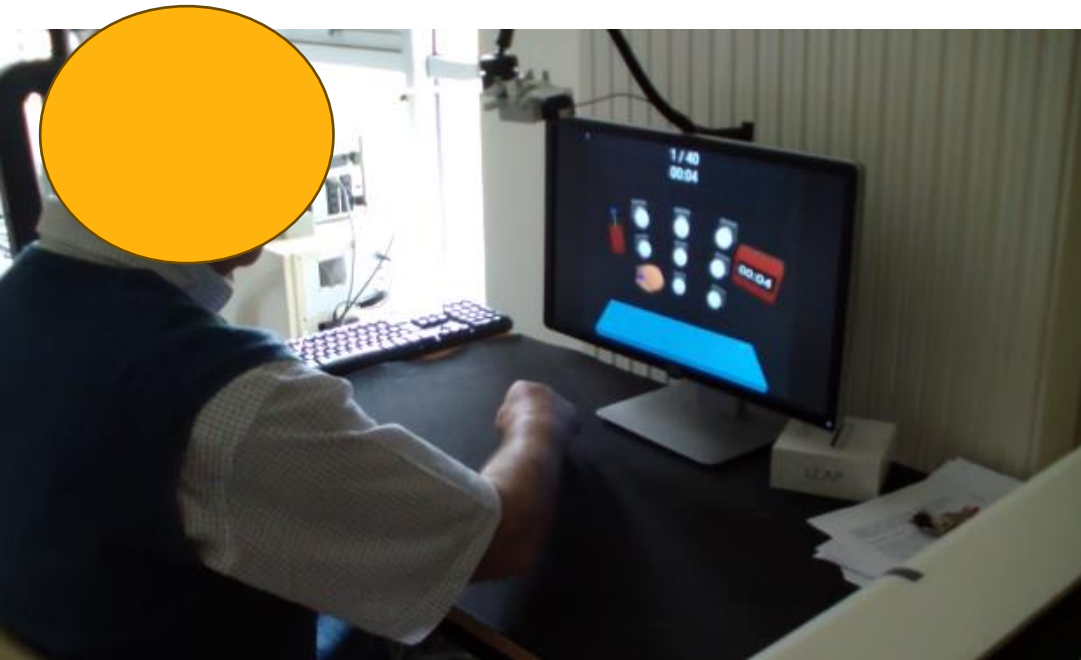
Associated article



Associated video (French spoken)

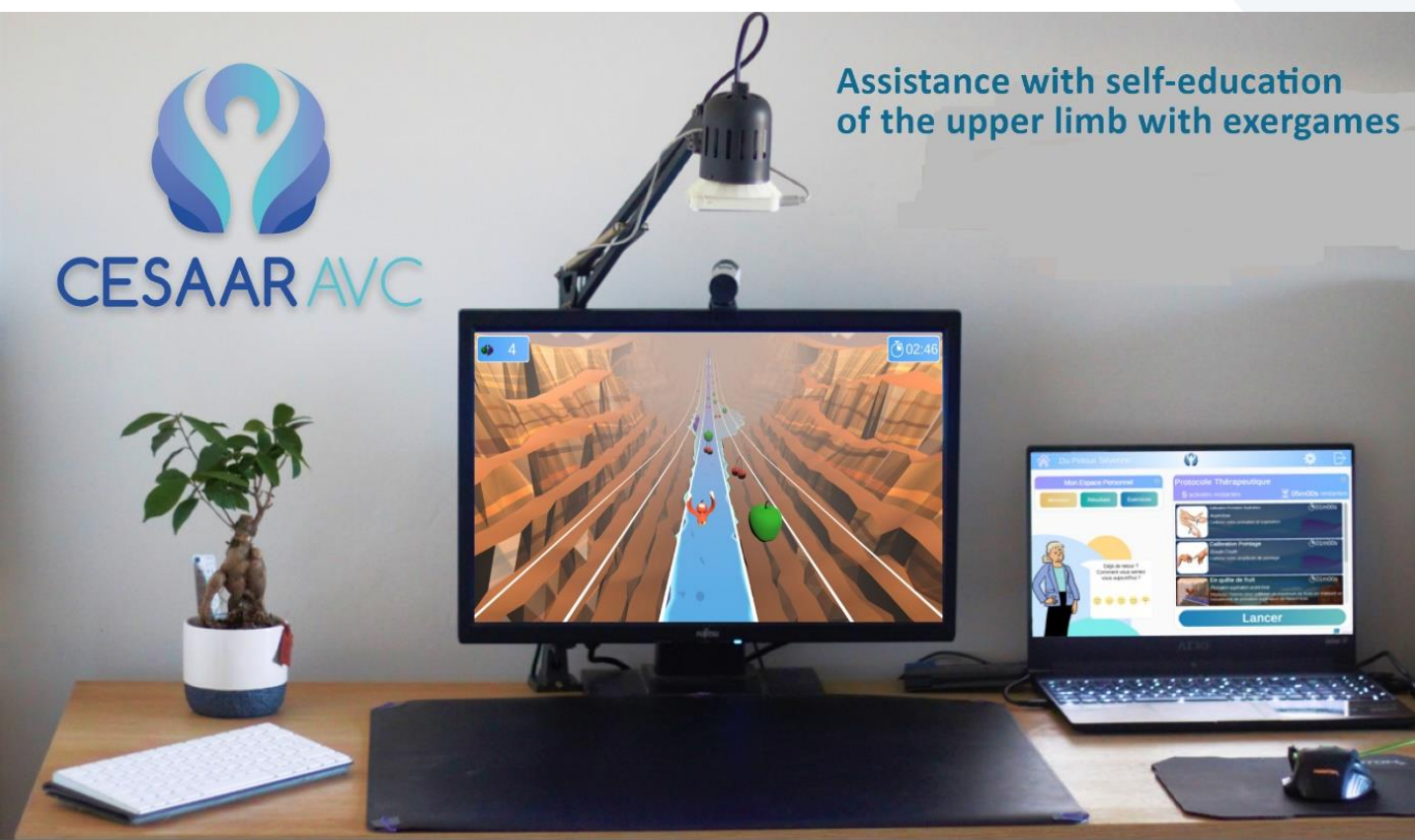


Main applications in E-Health



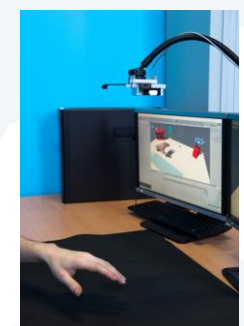
CESAAR-AVC
Web site

- CESAAR-AVC (2015-2022)
- The project aims to *create exergames for auto-rehabilitating people* whose upper body movements were diminished by a stroke.
- Partners: 3 Soleils Clinic, e-health french company, European funds for regions (FEDER), French ANRT
- Project lead: PR Samir Otmane & Guillaume Bouyer, Amine Chellali for IBISC, Paul Gobin & Christophe Duret for 3 Soleils Clinique
- *Ph.D Ludovic David (2016, Def. 2019)*



Assistance with self-education
of the upper limb with exergames

- Pronosupination movements of the wrist **Exergame 1**
- Pointing movements of the arms and shoulders **Exergame 2**
- Virtual trajectory followed by hands **Exergame 3**



- Device: Leap Motion
- Programming system: Unity

