

# AR in visual scanning training

## Implementing eye-tracking in an AR game to stimulate visual scanning behavior in patients with neglect

Visuospatial neglect is a disorder that often follows stroke. Its most typical feature is failure to report or respond to stimuli presented from the contralateral space. Currently, the standard treatment for neglect is a visual scanning training (VST), designed to improve viewing and searching behavior. Augmented reality (AR) could improve the standard VST by:

- ensuring a safe environment while practicing in different situations (in terms of augmented objects).
- giving more insight in specific looking behavior in a patient (in terms of eye-movements).
- enabling the possibility to keep the scanning factors consistent.



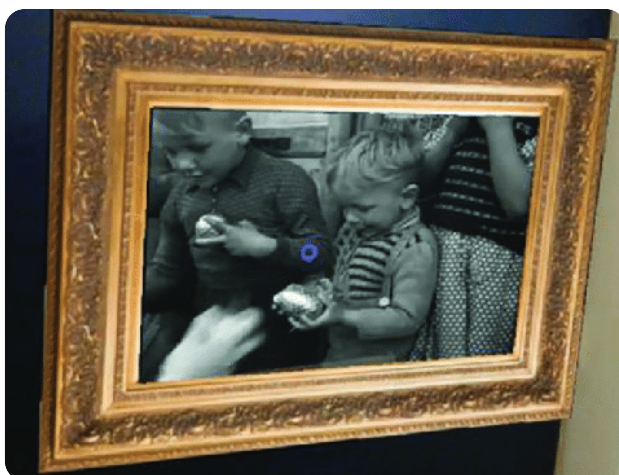
Now



Future



## Serious Gaming: Virtual Museum



- The player can physically move through a room.
- The player needs to look for paintings on the walls of the room.
- If the player looks at the painting, a movie will be played (as a reward).
- Eye-movements while searching for the paintings is recorded.



## Current phase: using different areas to test the game and building an eye tracking model



# Cognitive Profiles after Congenital Heart Disease Detected with an Immersive Virtual Reality Serious Game

Bousché, E. <sup>1</sup>, Huygelier, H. <sup>1,2</sup>, Southcombe, C.L. <sup>1,3</sup>, Ten Brink, A.F. <sup>1</sup>, Breur, J.M.P.J. <sup>3</sup>, Van Schooneveld, M.M.J. <sup>4</sup> and Nijboer, T.C.W. <sup>1,5</sup>

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<sup>3</sup> Department of Cardiology, Wilhelmina Children's Hospital, Utrecht, The Netherlands.

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<sup>5</sup> Center of Excellence for Rehabilitation Medicine, Brain Center Rudolf Magnus, University Medical Center Utrecht, Utrecht University and De Hoogstraat Rehabilitation, The Netherlands.



www.smartneurolab.nl

## Objective

- Cognitive impairment can occur after open heart surgery in early life.
- Cognition is most often assessed with neuropsychological paper-and-pencil tasks. **Yet:**
  - Tests are not sensitive enough to detect mild impairment
  - Tests often lack ecological validity (level of cognitive complaints; including multitasks, dynamic environment, interaction)
- Immersive VR Serious Games may offer assessment in a dynamic and more ecological manner and make assessment more sensitive.
- **Question:** Can we detect domain-specific cognitive impairment in children with congenital heart disease using an adaptive immersive VR serious game?

## Methods

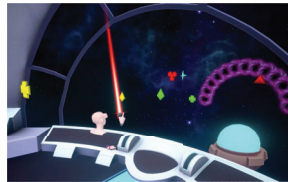
- Participants (ongoing data collection):
  - 42 Children with Congenital Heart Disease (CHD) who underwent open heart surgery in early life
  - 10 Healthy controls
- Outcome measures:
  - Performance = accuracy x difficulty level (range: 0 – 1000)

## VR Serious Game



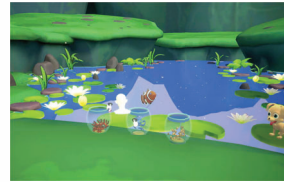
**Alien Outpost**  
Divided attention, visual attention, multitasking and information processing speed.

*Alien Outpost is based on the useful field of view (UFOV) task and other dual-task paradigms.*



**Galactic Diamond Belt**  
Selective attention, inhibition and information processing speed.

*The Galactic Diamond Belt is based on visual search tasks such as the D2 test.*



**Mystical Lake**  
Multitasking, prioritization, inhibition and decision-making abilities.

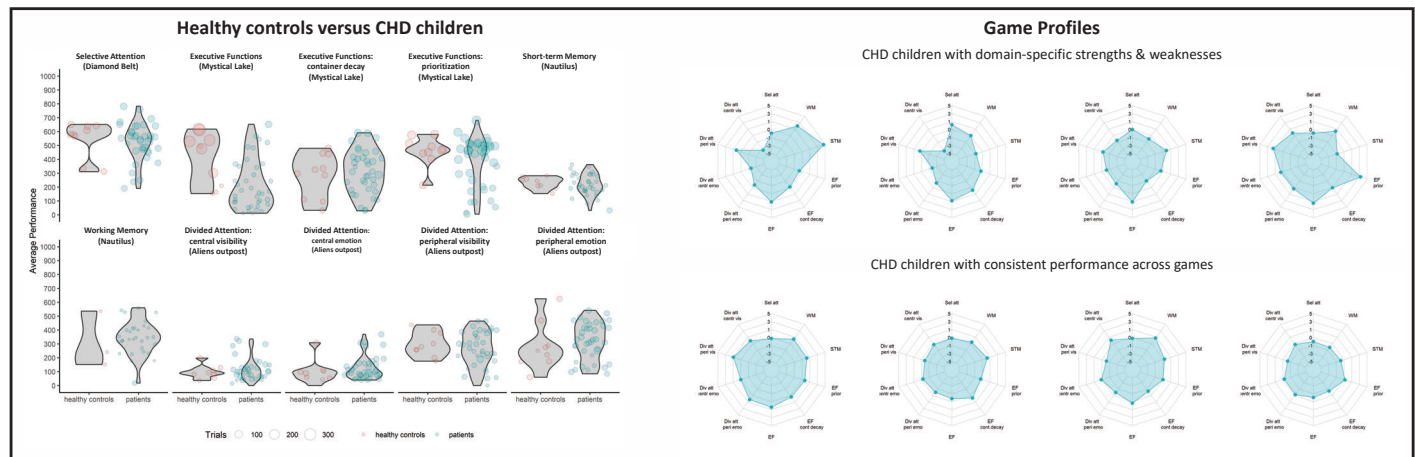
*The Mystical Lake game is based on three main neuropsychological paradigms: the Wisconsin Card Sorting Test, set shifting and Go/No-Go tasks.*



**Nautilus Underwater Memory**  
Long-term memory, short-term memory and working memory.

*The Nautilus Underwater world is based on long-term memory paradigms, the Paired Associates test, the Corsi-Tapping task, and Spatial span test.*

## Results



## Discussion

- Games may differ in discriminative power between healthy controls and patients with CHD
- Preliminary game profiles reveal domain-specific impairments in some children with CHD
- Future perspectives:
  - Considering age, game experience and other characteristics of participants
  - Exploring more advanced outcome measures (e.g. strategy, performance stability)



# Innovative Technology to Improve Return to Work After Acquired Brain Injury

Charlotte van de Wouw, Nine Pletting, Hanne Huygelier, Tanja Nijboer

Following acquired brain injury (ABI), return to work is not certain - only 40% of ABI patients resume work within two years. Employment is an important part of social and community participation, with a major impact on daily life, self-esteem and perceived quality of life.

The aim of this new project – ‘Job-E-Tunities’ - is to innovate cognitive diagnostics to improve the employment (re)integration process.



### Conventional neuropsychological assessment (NPA):

- ⊖ Does not reflect the dynamics of daily life (e.g., additional time pressure & distractions)
- ⊖ Difficult to predict consequences at levels of activity and participation
- ⊖ Not sensitive enough to detect mild cognitive impairment



### Potential added value of innovative technology:

- ⊕ More ecologically valid environments
- ⊕ Precise stimulus presentation & response collection
- ⊕ Current method to objectify work capabilities could be applied in Virtual Reality (VR)
- ⊕ New outcome measures (e.g., eye-tracking & motion-tracking features)

### Methods

- 50 patients in the chronic ABI phase & 40 healthy control participants

#### A Sensitive Measure?

#### Feasible?

Measured by:

- Digital-NPA (Emma Toolbox)
- Paper-&-pencil tasks (MoCA)
- **Virtual simulation performance** (Virtual Reality Fast-food Restaurant)

Measured by:

- Completion rate
- Completion time
- User experience questionnaire

- Behavioural observation (Melba)
- Questionnaires

### Virtual Simulation Fast-food Restaurant



Mimics a fast-food restaurant  
 “Can I take your order please?”

### Working Together with Experts by Experience

An important aspect for clinical relevance and smooth future implementation is working with the end-users from the beginning of a project (e.g., clinicians & patients). Job-E-Tunities was developed at the highest level within the Involvement Matrix.

INVOLVEMENT MATRIX		ROLE IN PROJECT RESEARCH				
		Listener I give information	Co-thinker I'm asked to give opinion	Advisee Others just checked advice	Partner Works as an equal partner	Decision-Maker They decide, I just discuss
STAGE OF PROJECT RESEARCH	Preparation				■	■
	Execution				■	■
	Implementation				■	■

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www.participationmatrix.nl

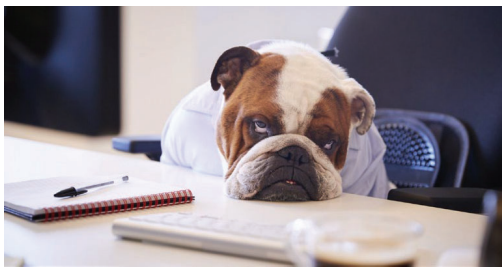


Scan to watch our film about the ‘Job-E-Tunities’ project, including the end-users!

# Playing for Cognition

## Serious Gaming: What are the Opportunities for Innovative Cognitive Diagnostics in Children with Acquired Brain Injury?

Children with acquired brain injury have been found to have an increased risk of cognitive deficits and developmental delays. Conventional neuropsychological assessment tasks are not highly predictive of daily functioning. Virtual Reality has the means to bridge this gap by creating immersive 3D dynamic assessment environments.



From this  
←  
→  
To that



- Children 9-13 year old with (1) congenital heart disease requiring open heart surgery within the first 6 months of life, (2) children born before 24 weeks of gestation, and (3) with birth complications (i.e., asphyxia, stroke).
- Conventional neuropsychological assessment and four VR Serious Game Koji's Quest games measuring attention, executive functioning, and memory.
- Children who show deficits are invited to take part in a 6 week at home training program of the VR Serious Game Koji's Quest.



Scan for more info

## Multisensory, dynamic, and contextual assessment environment



- Feed jumping fish to measure your executive functioning.
- Search for appearing aliens and gems to measure attention.
- Imitate opening shells to measure your memory capacity.



# Presentation Skills and Virtual Reality: *Pleitvrij*

Dr. Emanuel van Dongen, Associate Professor Private Law, Faculty of Law, Economics and Governance

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## Important aspects of XR technology

- A virtual, authentic (and thus realistic) courtroom
- Peer feedback (app) and recording of plea

## Persons involved

- Emanuel van Dongen (REBO), Antoinette Bakker (REBO), Jessica Hegeman (O&T/FSW)
- In cooperation with colleagues from the Vrije Universiteit Amsterdam and the Rijksuniversiteit Groningen

## Reasons

- By using VR technology, law students meet each other in a virtual courtroom and be questioned by a teacher in the role of a judge. This creates a **unique opportunity** for students to practice their pleading skills and to improve their performance in the courtroom.

## Study of effects

- We study this matter by focusing on four mechanisms: value/usefulness, competence, confidence, and reflective thinking.
- In addition, we study stress as this might be connected with the VR exercises, which, if reduced, can lead to better performances.

## Hardware

Webcamera Logitech C920, pc met netwerk aansluiting en Firefox, Oculus Rift S, Green screen.

## Software

Pleitvrij



## Background

As a consequence of the digital transformation, the development of the so-called 21st century skills is crucial for the participation in a rapid changing world and job market. Computational Thinking (CT) as one of those skills is a way of approaching problems with strategies and thoughts similar to those applied by a computer scientist.

## Need

The availability of specialized information technology varies considerably and thus often prevents the teaching of digital skills. Also, the socioeconomic status is unfortunately a strong predictor for Computational Thinking skills and indicates towards the existence of a so-called digital divide.

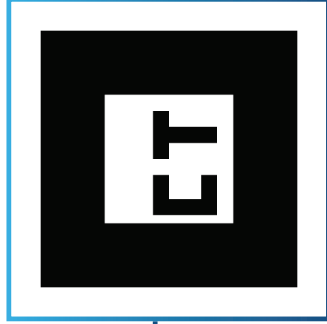
## Impact

The <code>colette/> project provides educators with a low-threshold approach using the Bring-Your-Own-Device approach to embed the teaching of Computational Thinking in their classes. Thus, more students can engage in and learn about Computational Thinking all over Europe.

## Take a peek



1. Scan QR Code



2. Scan Marker

## Contact

Project Reference 2020-1-DE03-KA201-077363

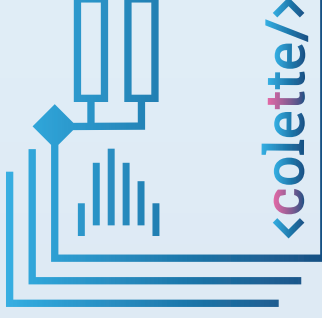
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<https://colette-project.eu/>

Co-funded by the  
Erasmus+ Programme  
of the European Union



# Computational Thinking Learning Environment for Teachers in Europe

A 21<sup>st</sup> Century skill in Education



## Intellectual Outputs within the project are...

An interactive **web portal** which provides authoring tools to easily modify exemplary tasks. The tasks can be adapted by the teachers and put together in task sequences catering to the learners' individual abilities.



An **app for mobile devices** in which the students can work on tasks assigned to them by their teacher and in which they can submit their solutions. It will be possible to create and run algorithms as well as to use Augmented Reality.



A catalogue of **generic tasks**, i.e. a collection of best-practice and sample tasks that can be used to foster Computational Thinking. These tasks will target different ages and ability levels and there will be content to use in lower as well as in upper secondary school.



A **manual** introducing the concept of Computational Thinking and explaining educators how to use and embed <colette /> in their classrooms which helps teachers to learn about the basic functionalities on their own.



A modularized short-term curriculum for **teacher trainings** in which educators get familiar with the concept of Computational Thinking and <colette />.



## Results

At the end of the three-year lasting strategic partnership, we will provide European teachers with a holistic concept of how Computational Thinking can be taught.

The two-component low-threshold learning environment, set of generic tasks, handbook and short-term curriculum will support teachers on three different levels:

Technical

Material-based

Educational

## Consortium

The consortium consists of seven partners from five different European countries:

Goethe University Frankfurt am Main | GER  
Project Coordinator, web portal

Autentek GmbH | GER  
App-based learning environment

Univerzita Konstantina Filozofa Nitre | SVK  
Generic Tasks for lower secondary level

Utrecht University | NL  
Generic Tasks for upper secondary level

University of Potsdam | GER  
Manual for teachers

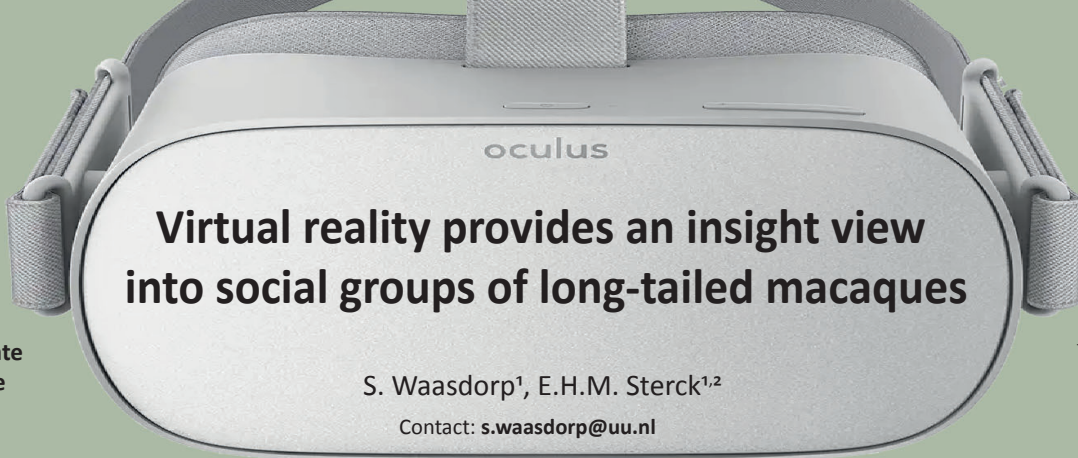
Université Claude Bernard Lyon 1 | FR  
Short-Term Curriculum

Johannes Kepler University Linz | AUT  
Dissemination





Biomedical Primate  
Research Centre



# Virtual reality provides an insight view into social groups of long-tailed macaques

S. Waasdorp<sup>1</sup>, E.H.M. Sterck<sup>1,2</sup>

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Utrecht University

1. Animal Behaviour & Cognition, Department of Biology, Faculty of Science, Utrecht University, Utrecht, The Netherlands
2. Animal Science Department, Biomedical Primate Research Centre, Rijswijk, The Netherlands

## Multi-generational groups

**Rhesus and long-tailed macaques** (*Macaca mulatta*, *M. fascicularis*) in the wild and at the Biomedical Primate Research Centre (BPRC) in Rijswijk, The Netherlands, live in **multi-generational groups**, where **females stay their whole life with maternal kin**<sup>1,2</sup>. At the BPRC males are removed from their natal group at an age where they would **disperse** in the wild, when they reach sexual maturity<sup>1,2</sup>. Breeding males at the BPRC are introduced to a group every 4 to 5 years, to prevent inbreeding<sup>3</sup>. Macaques in multi-generational groups show a rich repertoire in social behaviour<sup>4</sup>. The patterns in their behaviour are similar to those of their wild conspecifics<sup>5</sup>.



## Multi-generational groups versus peer groups

- Multi-generational groups:**
- Mimic group composition and dynamics of wild macaque groups (female philopatry and male dispersal)
  - High group stability due to female coalitions<sup>6</sup>
    - Higher birth rates<sup>7</sup>
    - Higher offspring survival<sup>7</sup>
  - Females conceive earlier after giving birth than the infant removal age-norm of 10mo<sup>7</sup>



## Virtual Reality experience

To train students, Utrecht University set up a Monkey reality<sup>8</sup>, Virtual Reality (VR) project. We made **360 degrees** video recordings within the outside enclosure of long-tailed macaques housed at the BPRC. With this VR project, we train students how to observe monkeys and present how social groups of macaques live at the BPRC. Watching these videos through a VR headset provides a useful insight into the housing of the multi-generational macaque groups. Moreover, species-specific social behaviours and group dynamics can be observed from a point of view as if you are one of the monkeys.



## Goals of virtual reality

- Learn behavioural repertoire
- Practice observation methods
- Experience field work from external location

Watch the monkeys:



<sup>1</sup> Lindburg, 1971. Primate behav., 2, 1–106.  
<sup>2</sup> Sade, 2017. The functional and evolutionary biology of primates, 378–398.  
<sup>3</sup> Rox et al., 2021. Animals, 11(2), 545.  
<sup>4</sup> Hannibal et al., 2017. Am. J. of Primatol., 79(1), e22528.  
<sup>5</sup> Aureli et al., 1991. Ethology, 89, 101–104.  
<sup>6</sup> Rox et al., 2019. PLoS One, 14(7).  
<sup>7</sup> Rox, Waasdorp et al., 2022. Biology, 11(7), 970.  
<sup>8</sup> Duchateau, van den Berg, Sterck, 2017, Monkey Reality Project.



# HoloLearn

## Mixed Reality scenario training

K.Valkenet<sup>1,2</sup>, C. Akkermans<sup>3</sup>, T. Strikwerda<sup>1</sup>, A. de Rooij<sup>1</sup>, J. de Man-van Ginkel<sup>4</sup>, C. Veenhof<sup>1</sup>

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HoloLearn is a **Mixed Reality scenario training about movement centered care**. Nursing staff can practice real life scenarios with virtual patients using the Microsoft HoloLens II.

Like **Anna**, a very unmotivated patient who is capable to walk independently, but just doesn't feel like it. And **Mrs. de Jong**, who thinks her husband should just be cared for during hospital stay. She thinks he should stay in bed all day.



*Education  
with MR/AR  
increases  
learning impact*

(Tovar et al. 2020)



*Scan and watch the  
promotion video*

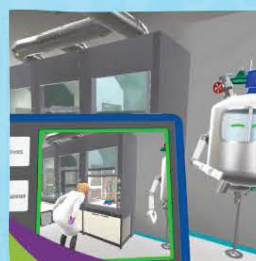
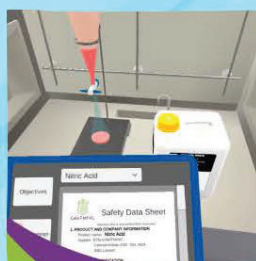
Chemical laboratories are workplace environments where risks of injury and even fatality are always present. Laboratory workers, in academia and industry, are required to have proficient safety awareness in order to minimise risk to an acceptable level.



Watch the demo video



However, investigation reports and reviews on laboratory accidents reveal that, due to lack of safety awareness and at-risk behaviour, unfortunate events still happen. Insufficient safety training is often identified as one of the causes for these accident, but we believe that the lack of a real life experience of risks and, at that point, immersive training comes into play. For this reason, researchers of the European Training Network CHARMING have collaborated to develop a laboratory safety training, called “VR LaboSafe Game”, that utilises Virtual Reality (VR) technology and serious game design to train the safety awareness and safety behaviour of laboratory workers. By using a VR head-mounted display, the trainees are fully immersed in a virtual laboratory performing realistic tasks that are otherwise too expensive or dangerous to replicate in real life. In this game, laboratory workers learn to accurately identify risks, minimise these risks and perform experiments safely. Unsafe behaviour and unresolved risks result in simulated consequences that trainees experience without real harm to themselves or others.



ARKEMA

KU LEUVEN

Newcastle University



Utrecht University



CHARMING

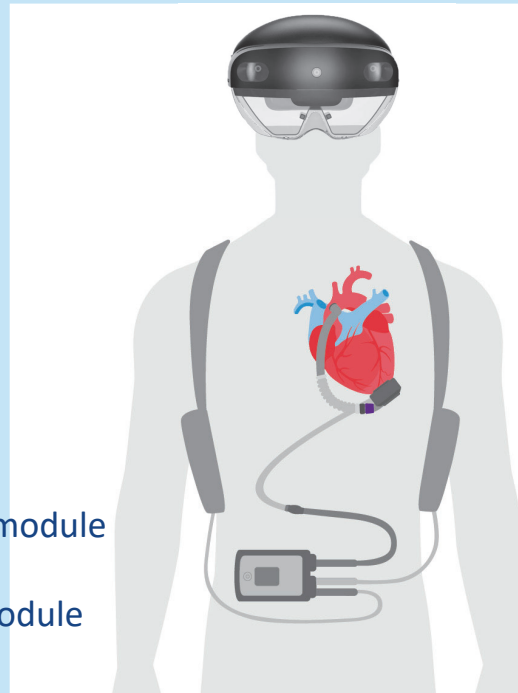
<https://github.com/PhilippeChan/VRLaboSafeGameDemo>  
<https://charming-etn.eu/>

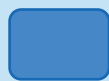



This project has received funding from the European Union's EU Framework Programme for Research and Innovation Horizon 2020 under Grant Agreement 812716.

# HoloVAD

*Patients with end-stage heart failure who are eligible for the implantation of a left ventricular assist device (LVAD), end up on a rollercoaster. Patient awareness and education of the device and belongings is essential for postoperative rehabilitation and discharge from the hospital. Continuous access to this interactive extended reality environment leads to a faster and better acquisition of knowledge.*



 Information module  
 Interactive module

The heart

Heart failure

HeartMate 3

*Lifestyle*

Change and recharge of batteries

*Alarm scenario training*

*Drive line exit site care training*



HeartMate 3  
Demo

Battery  
Training Demo



*Questions?*

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Karin Valkenet, [karin@holomoves.nl](mailto:karin@holomoves.nl)

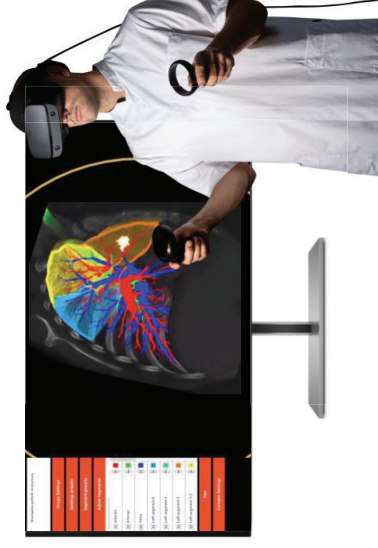
# MedicalVR Perfect Surgical Decision Making Improves Patient Lives



Conventional pre-operative planning of complex lung surgeries like lobectomy or segmentectomy procedures with only CT-scans is a daunting task for both junior and senior surgeons.

Lung segments are not visible on CT-scans which makes it hard to plan segmentectomies.

Anatomic variation per patient is high requiring a tailored approach to understanding CT-scans.



MedicalVR enables patient specific planning, simulating and performing surgeries in 3D

Highlights:

- >230% more complex lung surgeries at launching customer Erasmus MC
- 52% change in surgical plan compared to standard CT-scans\*
- +100 successful surgeries
- More healthy lung tissue, better surgical margins and less complications
- Q4 2022: Multi center study with 8 hospitals including UMC Utrecht

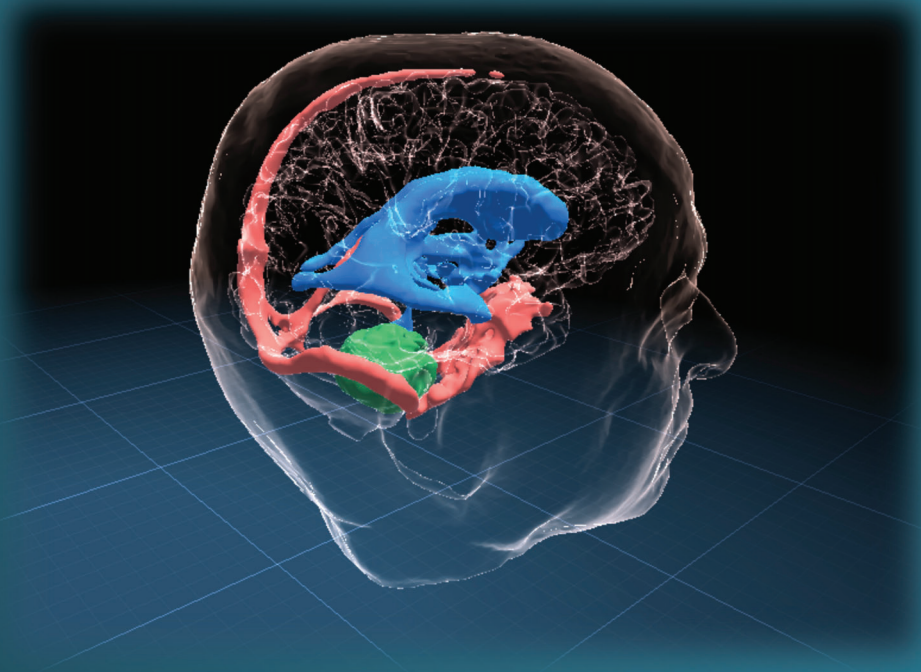


Scan QR for videos about:  
surgical planning or training





# AUGMEDIT

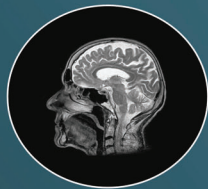


Making the invisible visible

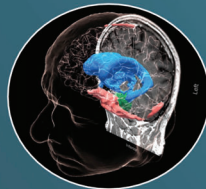
Using 2D imaging technology for preoperative and operative care is difficult, inefficient and provides room for error. Augmedit's intuitive AR based system accelerates the surgeon's insights that will drive improved patient outcomes and costs savings



Patient Scan  
(MRI / CT)



Store in  
Local PACS



Prepare  
Holograms

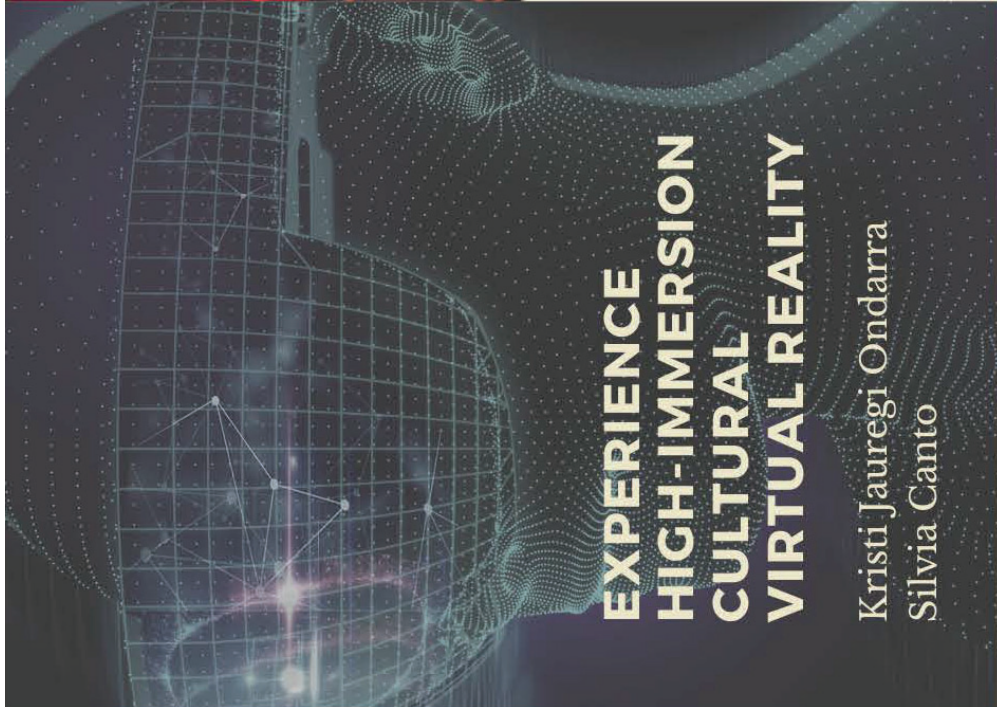


Practice in  
3D



Surgery with  
Holograms

Treat what you see, see  
what you treat



# EXPERIENCE HIGH-IMMERSION CULTURAL VIRTUAL REALITY

Kristi Jauregi Ondarra  
Silvia Canto

"It is nice to have the opportunity to walk around and show stuff to the other person. That makes the situation more relaxed"

(student from Utrecht University)

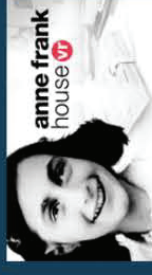
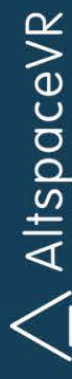


Our research shows that these applications have the potential of changing the ways learners practise speaking a foreign language, enabling real-time interpersonal conversation and allowing users to perform activities together.



## HOW CAN WE ENRICH FOREIGN LANGUAGE LEARNING PROCESSES?

With the use of various apps (Altspace VR, National Geographic explore VR, Anna Frank house vr, etc.) students, participating in a virtual exchange, carry out tasks communicating in the target foreign language.



(Jauregi-Ondarra, Gruber & Canto, 2021)

# Exploring Neuroscience Literature through Visualising Relations among Topics using Augmented Reality



Ghazaleh Tanhaei, Boyu Xu, Lynda Hardman, Wolfgang Hürst  
Department of Information and Computing Sciences | Utrecht University

## Motivation

As more papers are published, the harder it becomes for scientists to maintain an overview.

Exploring an extensive body of literature can be facilitated through **topic-based**, rather than **article-based**, interaction.

Use Case: **Neuroscience Literature**



Neuroscientists are interested in understanding the relationships between **brain regions** and **brain diseases**.

Identifying these relations is costly and not all of them are interesting. In neuroscience, an underlying goal is often to *identify high-potential relations for experiments*.

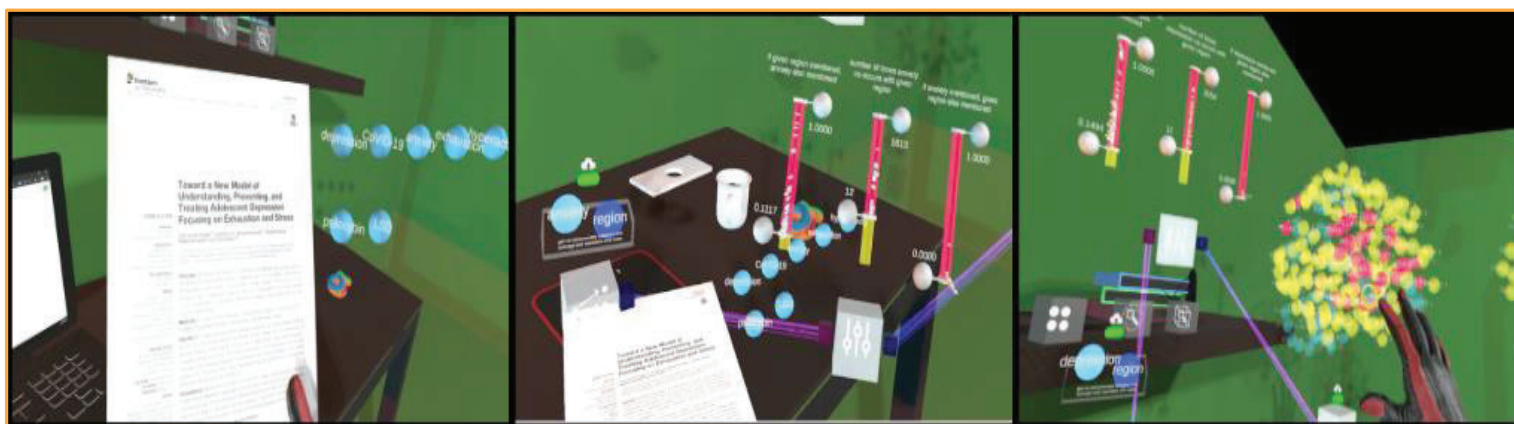


Immersive AR environment supports neuroscientists to extend their 2D workplace

## DatAR Solution

- Augmented Reality provides an environment for **exploring three-dimensional data binocularly** (e.g. brain regions visualization).
- Providing a 3D Immersive Analytics environment enables users to explore possible relationships in the research corpora.
- Augmented Reality would **improve** and **extend existing literature exploration workflows**.
- We hypothesize that 3D visualizations can support neuroscientists' relation-finding tasks.
- Augmented reality allows for **better integration** into existing workspaces and workflows.

## DatAR Prototype



Exploring neuroscience literature to find brain regions corresponding to a specific disease.

A user investigates brain regions co-occurring with Anxiety.

A user adjusts the filters for co-occurrences of brain regions with Depression.

## Contact Us?!

Ghazaleh Tanhaei <g.tanhaei@uu.nl>  
Boyu Xu <b.xu@uu.nl>

## Take part in our study?! Watch DatAR Video?! Read DatAR Publications?!



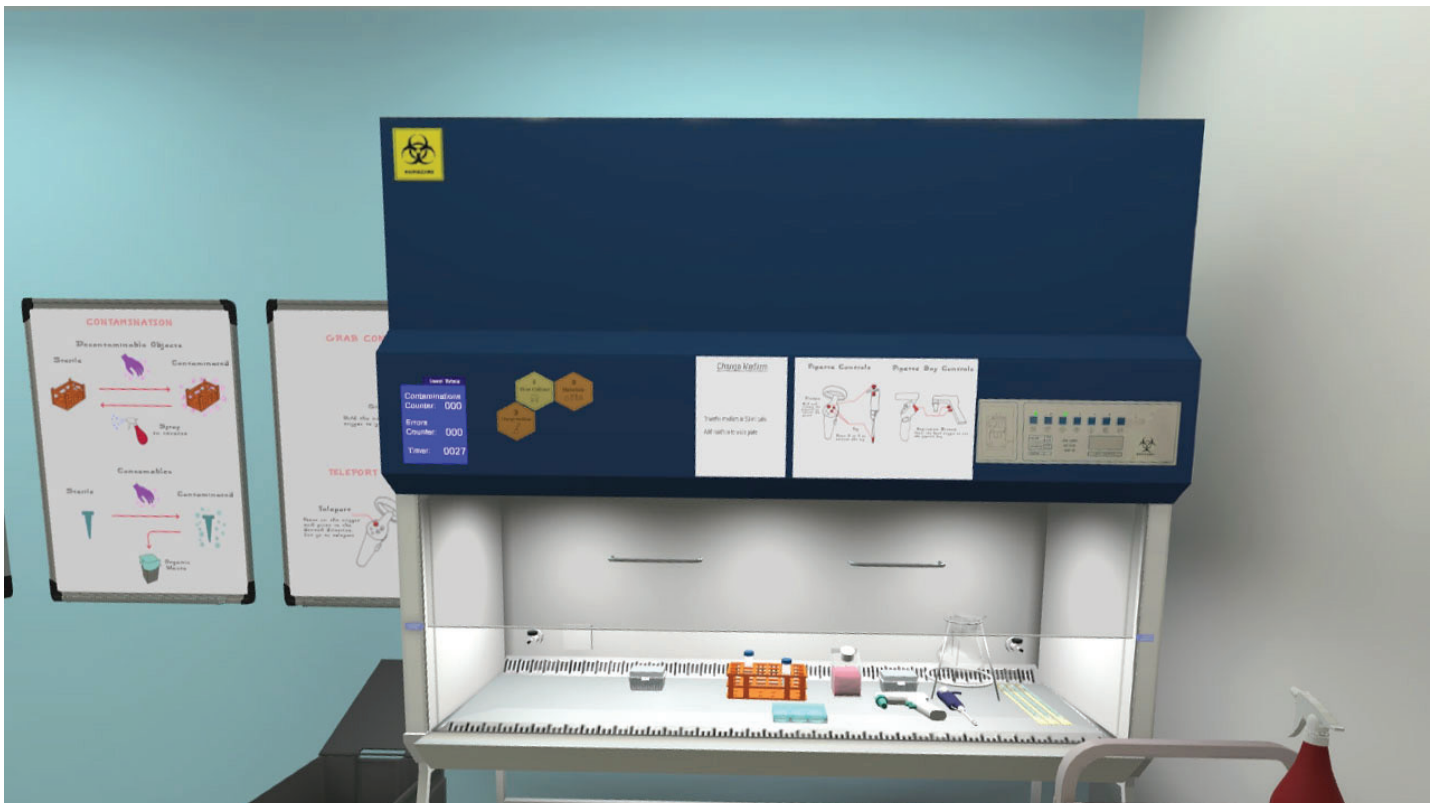
# Sterile working in the flow cabinet

Biomedical Sciences, UMC Utrecht

3rd year bachelor course Early Life Events

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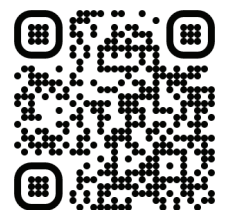
Sterile VR is a scenario in which students learn to work in a sterile manner in a virtual lab. The app came about since there is limited lab availability and sterility is a trainable skill that has a big movement component. The presence, agency, and bodily involvement that VR offers are seen as the big added values and convinced us to utilize the technology. The app is developed in Unreal Engine and is played using Pico neo 3 enterprise headsets.



Scan to take a look in the app!

"It feels like I am in the real lab!"

"This will be a great preparation for the lesson in the lab"





# Virtual Reality in onderwijs

## Van initiatie naar realisatie



UMC Utrecht

Opdrachtgever: Harold van Rijen, Directeur Biomedical Sciences, Onderwijscentrum  
Opdrachtnemer: Paul Velsink, afdeling Technologie en Leren, Onderwijscentrum

Mascha Berk, Anna-jeltje Eppinga, Joep van Gogh, Daan van der Ham, Jill van Knegsel, Kelly Kwant, Danza Onvlee, Lars van der Plank, Fiona Slond, Martijn Smit, Diana Zwart

2021

### Vooronderzoek

Doel: achterhalen potentie en toegevoegde waarde VR in onderwijs, waar kan het worden ingezet, intern ontwikkelen van 360° VR prototypes, randvoorwaarden in kaart brengen.

2022

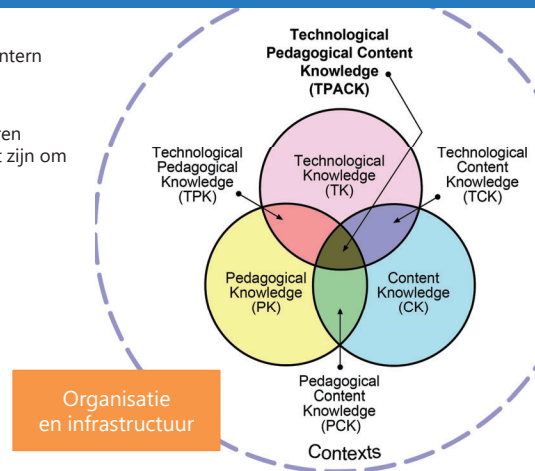
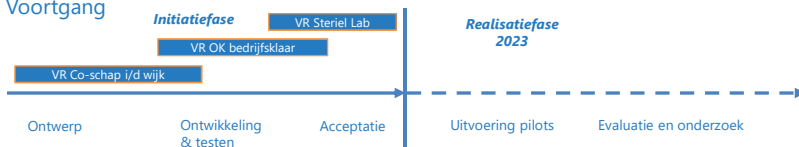
### Initiatie - doelstelling

Vervolgstappen maken om toekomstbestendig onderwijs buiten de fysieke locaties te standaardiseren middels Virtual Reality onderwijspilots ontwikkeld in 3D VR en 360° VR. Als UMC moeten we in staat zijn om onze primaire onderwijsstaak uit te voeren ten tijden van lockdown, beperkte capaciteit en als standaard onderdeel van het aanbod van het UMC voor toekomstbestendig onderwijs.

### Werkwijze

1. Ontwerp en ontwikkeling van Proof of Concepts (PoCs: inhoud/didactiek)
  - VR Bedrijfsklaar maken OK- opleiding UMCU Academie (kwaliteit, snelle inzetbaarheid)
  - VR Steriel Lab – opleiding BMW (capaciteit, duurzaamheid, kwaliteit)
  - VR Coschap in de Wijk – opleiding GNK (capaciteit, kwaliteit)
2. Onderwijsplan en evaluatieonderzoeksplan (didactiek)
3. Implementatieplan (techniek/organisatie)
4. Blauwdruk VR onderwijs platform
5. PID voor realisatie van pilots

### Voortgang



## VR Steriel Lab

### Onderwijscontext:

Biomedische Wetenschappen, cursus Early Life Events.

### Doel:

Bewustwording en bevorderen steriel werken in het lab, waardoor minder verspilling, extra labcapaciteit.

### Opzet pilot:

5 minuten video -> VR app -> labpracticum -> evaluatie.

### Opzet app:

Level 1: Weten wat steriliteit is

Level 2: Oefenen van handelingen steriel werken

Level 3: Uitvoeren experiment



## VR Bedrijfsklaar maken OK

### Onderwijscontext:

Operatieassistent en Anesthesiemedewerker, Beroepsvoorbereidende Periode (BVP).

### Doel:

Oefenen stappen bedrijfsklaar maken OK, waardoor snellere inzetbaarheid in praktijk, ontlasten praktijkbegeleiders.

### Opzet pilot:

Student oefent verschillende OK-scenario's tijdens de BVP, waarna praktijkbegeleiding op de OK volgt.

### Opbouw app:

1. Standaardprocedure bedrijfsklaar maken OK oefenen o.b.v. checklist (controles, apparatuur aanzetten).
2. Scenario's: specifieke operaties, onverwachte gebeurtenissen (telefoon, spoedoperatie etc.).



## Uitgangspunten

### Virtual Reality principles:

- Immersion (presence)
- Controle (agency)
- Fidelity (presence)

### Onderwijskundige principes:

- Situational Awareness
- Directe feedback (visueel, verbaal)
- Self-efficacy
- TPACK-model

### Ontwerp app:

- Personaliseren van avatar
- Begeleider kan meekijken via browser
- Registratie leeractiviteiten

### Software:

- Externe leverancier (Unity3D)

# IMPROVISE

### Hardware:

- Pico Neo 3 Pro headset



2023

### Realisatie Virtual Reality onderwijs pilots

- Doel: uitvoering van drie onderwijspilots in drie verschillende opleidingen die inzicht geven in:
  1. Hoe werkt VR-onderwijs, wat doet het met studenten en docenten?
  2. Welke organisatie en infrastructuur is nodig om VR-onderwijs als standaard te implementeren in curricula?
- Uitgangspunt: implementatieplan gericht op ruimtegebruik, beheer van hard- en software, ondersteuning in het onderwijsproces (incl. evaluatieonderzoek), compliancy (AVG, hygiëne).
- Vervolgroues: doorontwikkeling pilots, nieuwe pilots, standaardiseren.

### Strategische kaders

