

ENOTHE
European Network of Occupational Therapy in Higher Education

Hotel Vila Galé
Coimbra, Portugal

Therapeutic Games and Gamification in Occupational Therapy Education and Practice

Bridging Knowledge and Application

European Network of Occupational Therapy in Higher Education

Coimbra - Portugal

Fábio Pereira

Oct-2025



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Hotel Vila Galé
Coimbra, Portugal

Academic Background

Occupational Therapist



- ESS-IPP – Occupational Therapy Bachelor (2006-2010)
- ESS-IPP – Occupational Therapy Master (2010-2012)
- UMa – Informatics Engineering - HCI PhD (2017-2024)

Professional Experience

- APPDA-Norte – Intervenção precoce (2010-2014)
  - Autism Spectrum Disorder



Professional Experience

- APPDA-Norte – Intervenção precoce (2010-2014)
  - Autism Spectrum Disorder

- NeuroRehabLab/ARDITI (2015-2019*) *Actually kept collaboration until nowadays
  - Research Neurorehabilitation



Professional Experience

- APPDA-Norte – Intervenção precoce (2010-2014)
  - Autism Spectrum Disorders
- NeuroRehabLab/ARDITI (2015-2019*) *Actually kept collaboration until nowadays
  - Research Neurorehabilitation
- SESARAM – Physical Medicine and Rehabilitation (2019-2023)
- ISSM – Centro de Inclusão Social da Madeira / Madeira's Social Inclusion Center (2023-…)
  - Intellectual Disabilities (Adults)



≈ 30 researchers; 5 funded projects

Accumulated experience

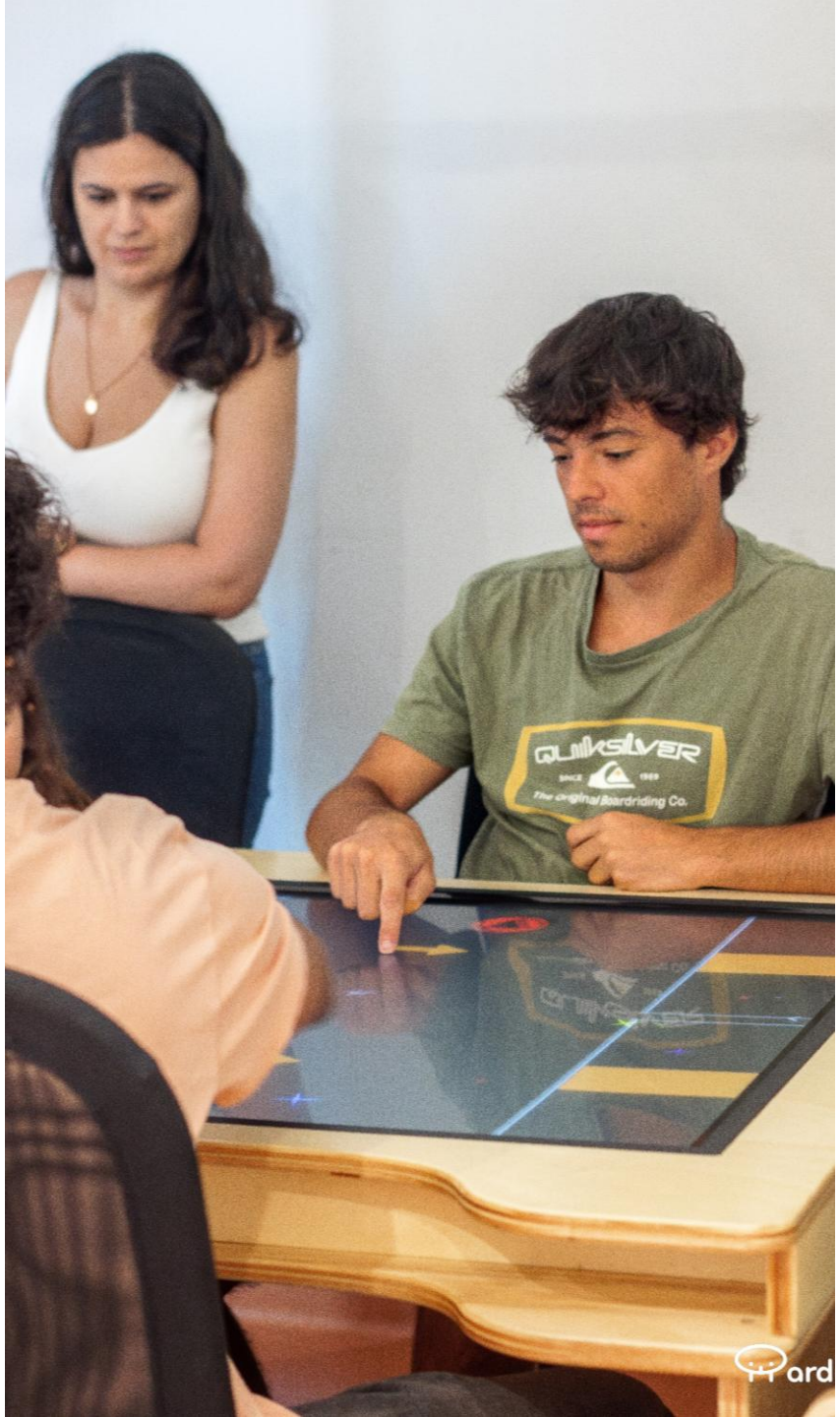
- Serious-games development	- Research methods & Implementation	- Sensors knowledge

Allowed to understand/learn how to use tech for rehab

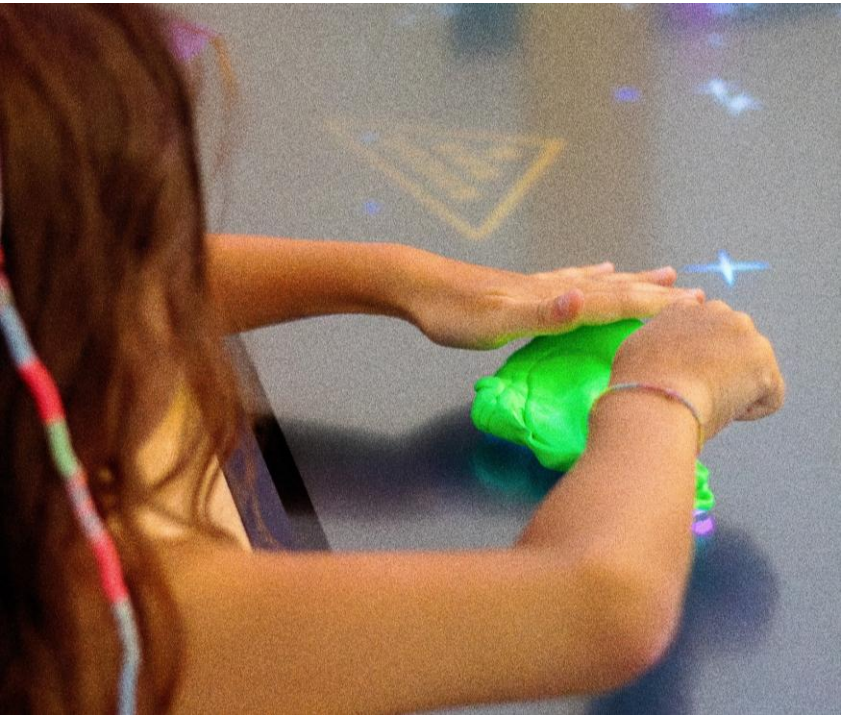
Differentiated skills for OT

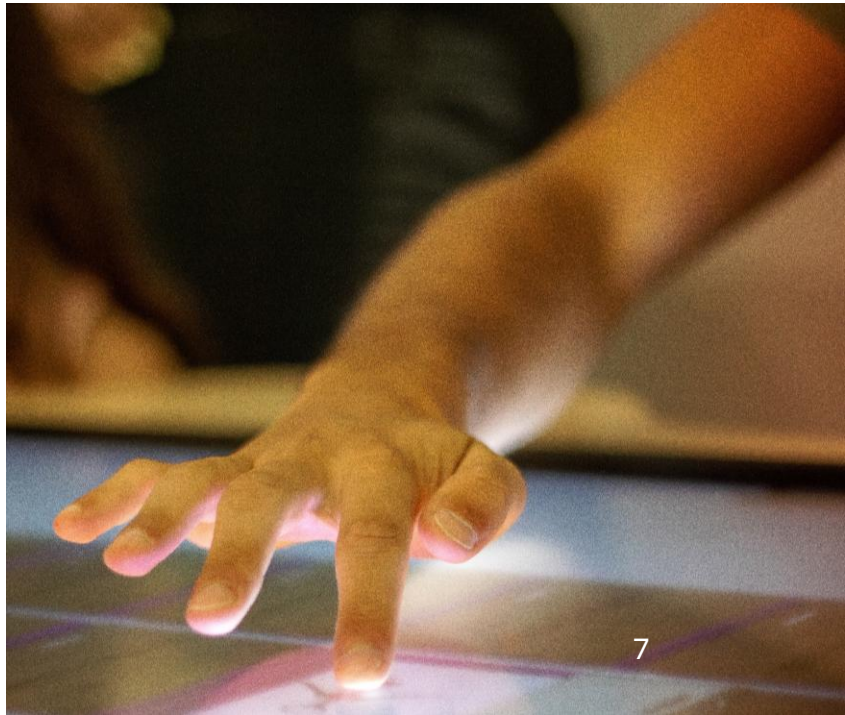



PRESSIONE 'N' PARA NOVA RONDA
FIM DA RONDA


QUIKSILVER







State of the Art



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Emotional impact (Depressive symptoms)

- Family life/relationships[1]

Social impact

- Social relationships[1]
- Social participation[2]
- Social isolation[3]

Negatively correlated[6]

Negatively correlated[7]

Self-efficacy

- Strongly related and positively associated with **motor performance[4] and motor skills[5]**

⇩ Motor outcomes[6,8]

[1]Kruithof *et al.*, 2015; [2]Northcott *et al.*, 2016; [3]Sienkiewicz-Jarosz *et al.*, 2010; [4]Korpershoek *et al.*, 2011; [5]Ahn *et al.*, 2015; [6]Medeiros *et al.*, 2020; [7]Volz *et al.*, 2016; [8]Torrisi *et al.*, 2018

Proposal

Group rehabilitation through an interactive table using personalized serious games and tangibles manipulation



Proposal

Group rehabilitation through an interactive table using personalized serious games and tangibles manipulation



Group rehabilitation – Social interaction

Proposal

Group rehabilitation through an interactive table using personalized **serious games** and tangibles manipulation



Group rehabilitation – Social interaction

Serious games - motor skills, self-efficacy, and motivation

Proposal

Group rehabilitation through an interactive table using personalized serious games and **tangibles** manipulation



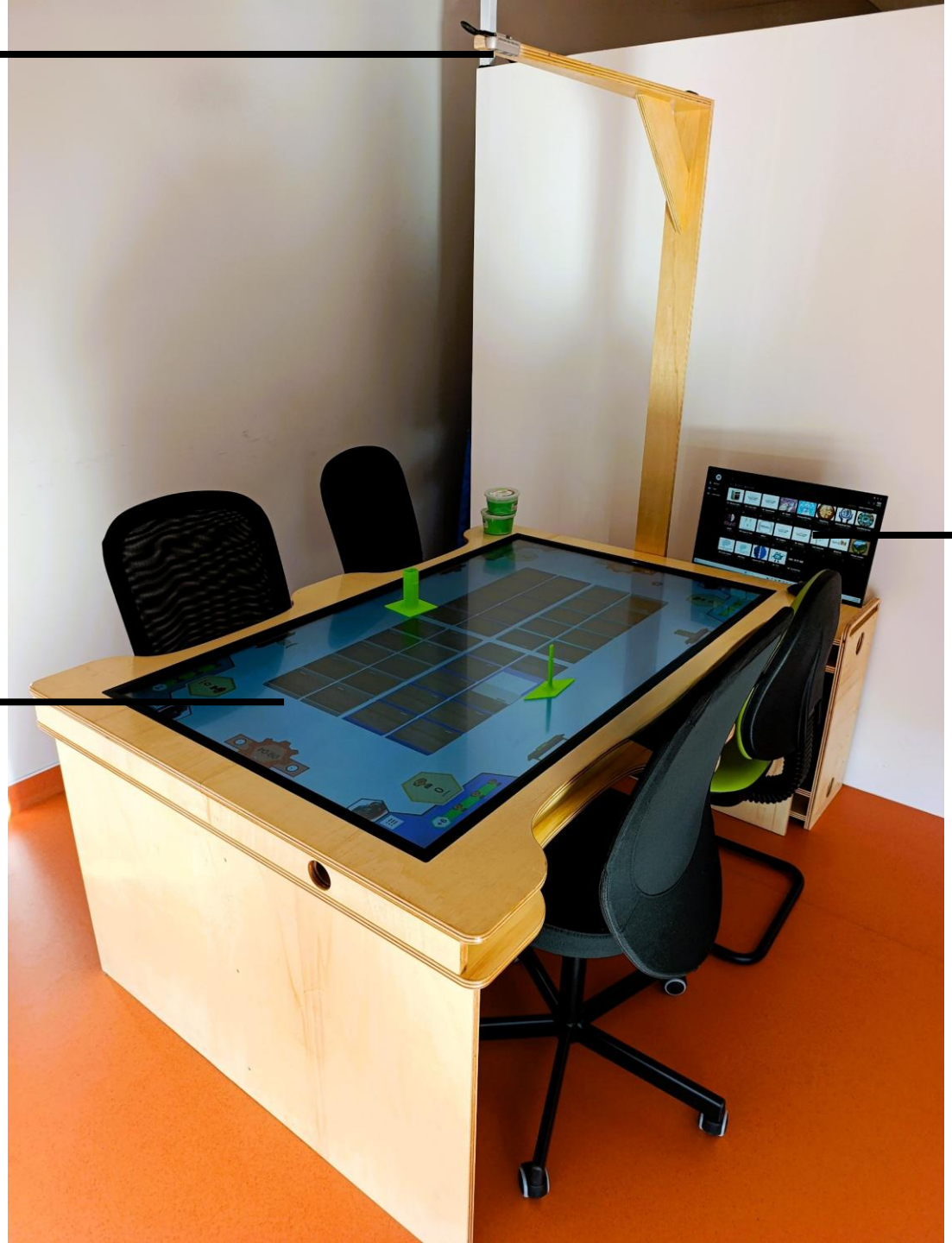
Group rehabilitation – Social interaction

Serious games - motor skills, self-efficacy, and motivation

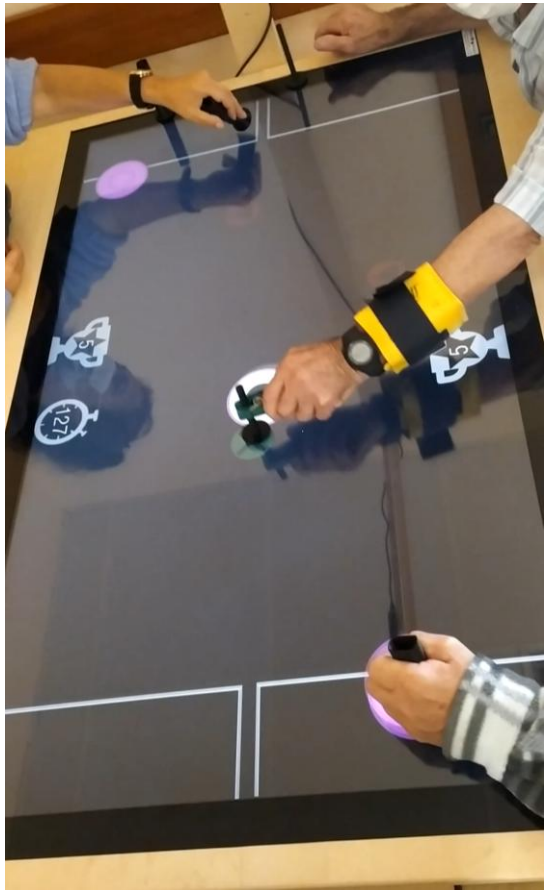
Tangibles – Ecological validity, motor learning transference, self-efficacy

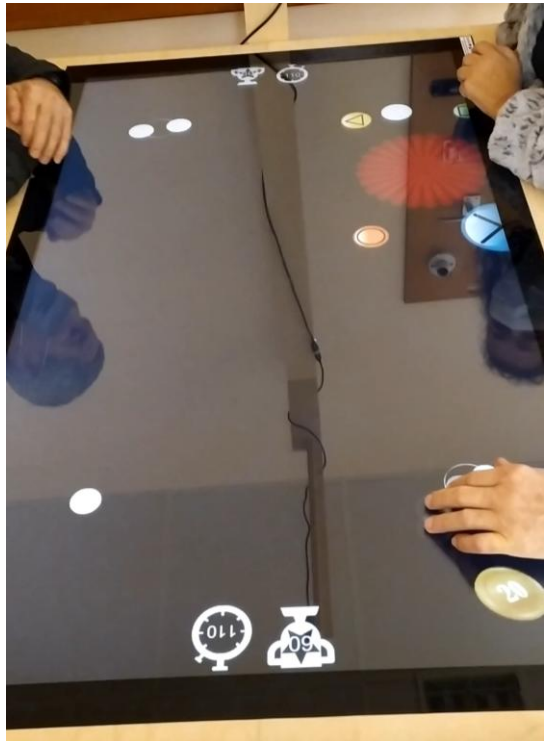
Depth/RGB camera (Real Sense)

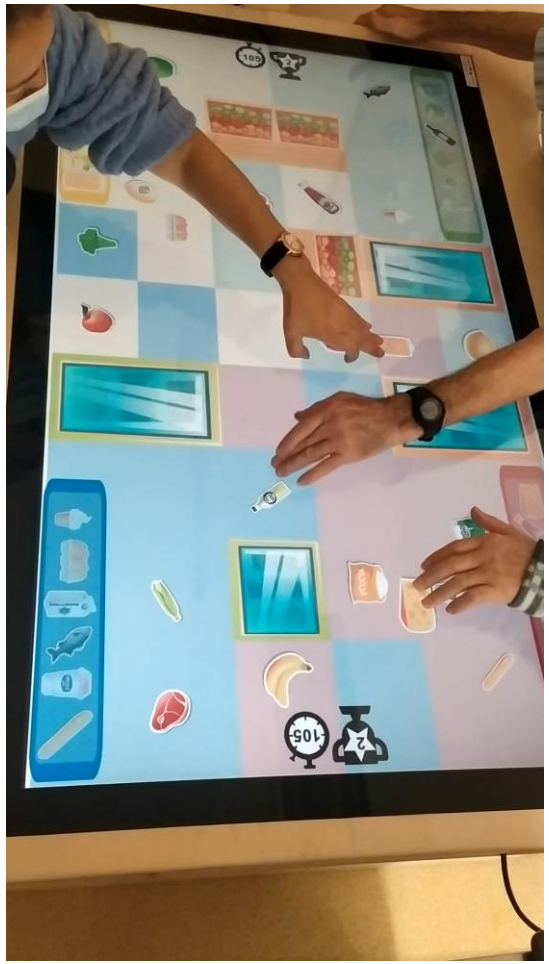
Multitouch Screen

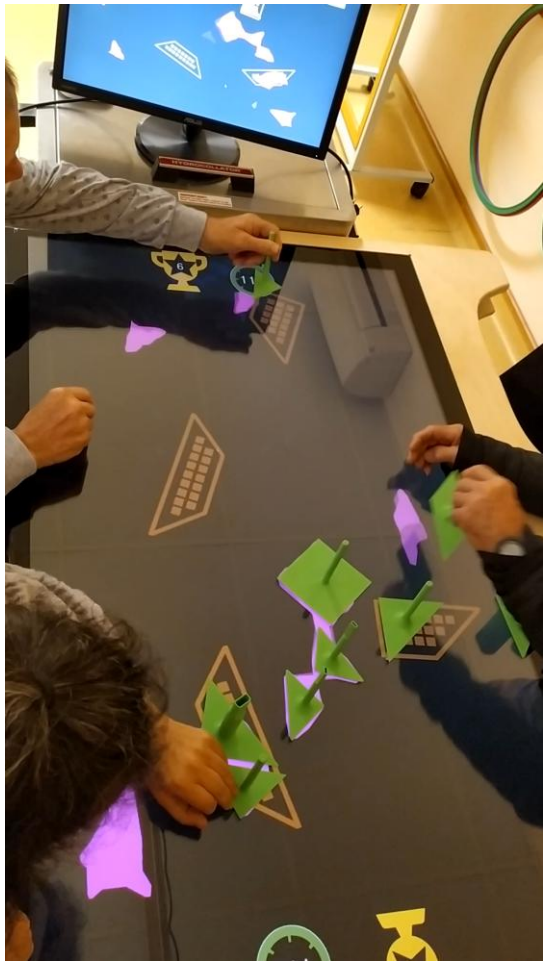


Auxiliary Screen (therapist)





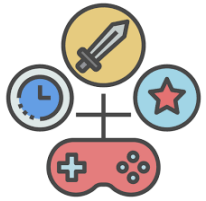




Main Findings/Contributions



- Comparison of the impact of 3 game modes on social involvement and motivation
- Impact of cognitive skills, motor skills, personality
- Research on interfaces and task mechanics feasibility and usability





Dissemination:



- 3 journals
- 2 conference
- 1 submitted
- 1 best student paper award
- 1 Regional prize (+ Value Madeira Prize)
- 1 National prize (Heath Inovation Prize)
- IT adopted by 3 institutions (4 replicas)



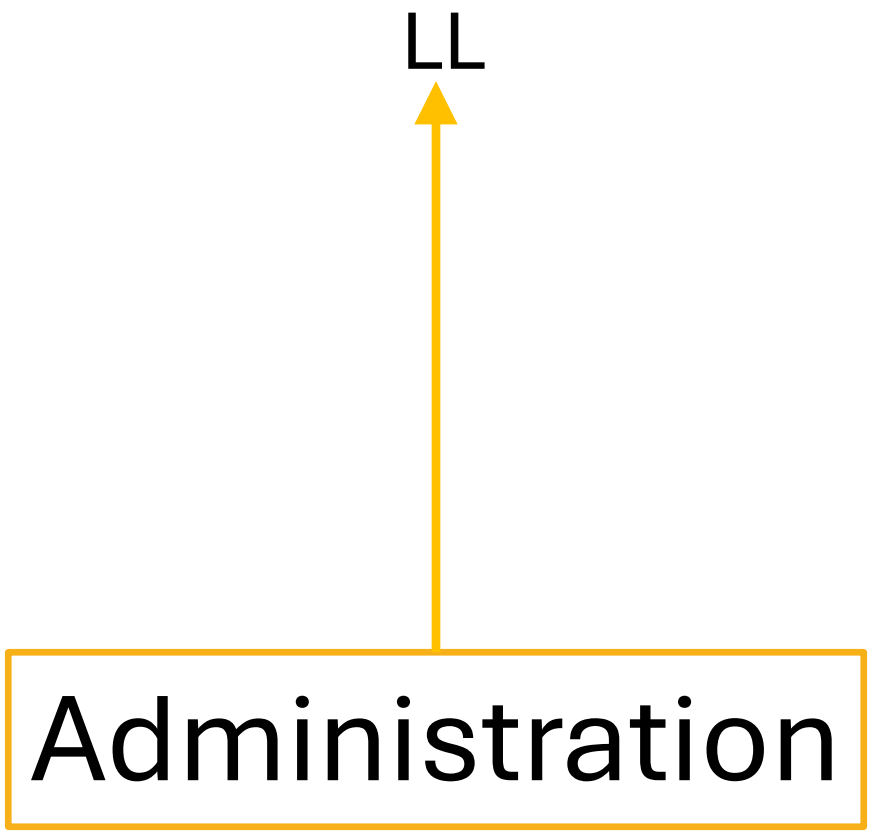
- Tracking software
- Interactive table
- Interfaces for rehab (3 grasps)
- 4 serious games



- Promising results of the proposed rehab approach (motor outcomes, motivation and usability)

Living Lab




LL
Administration



Administration

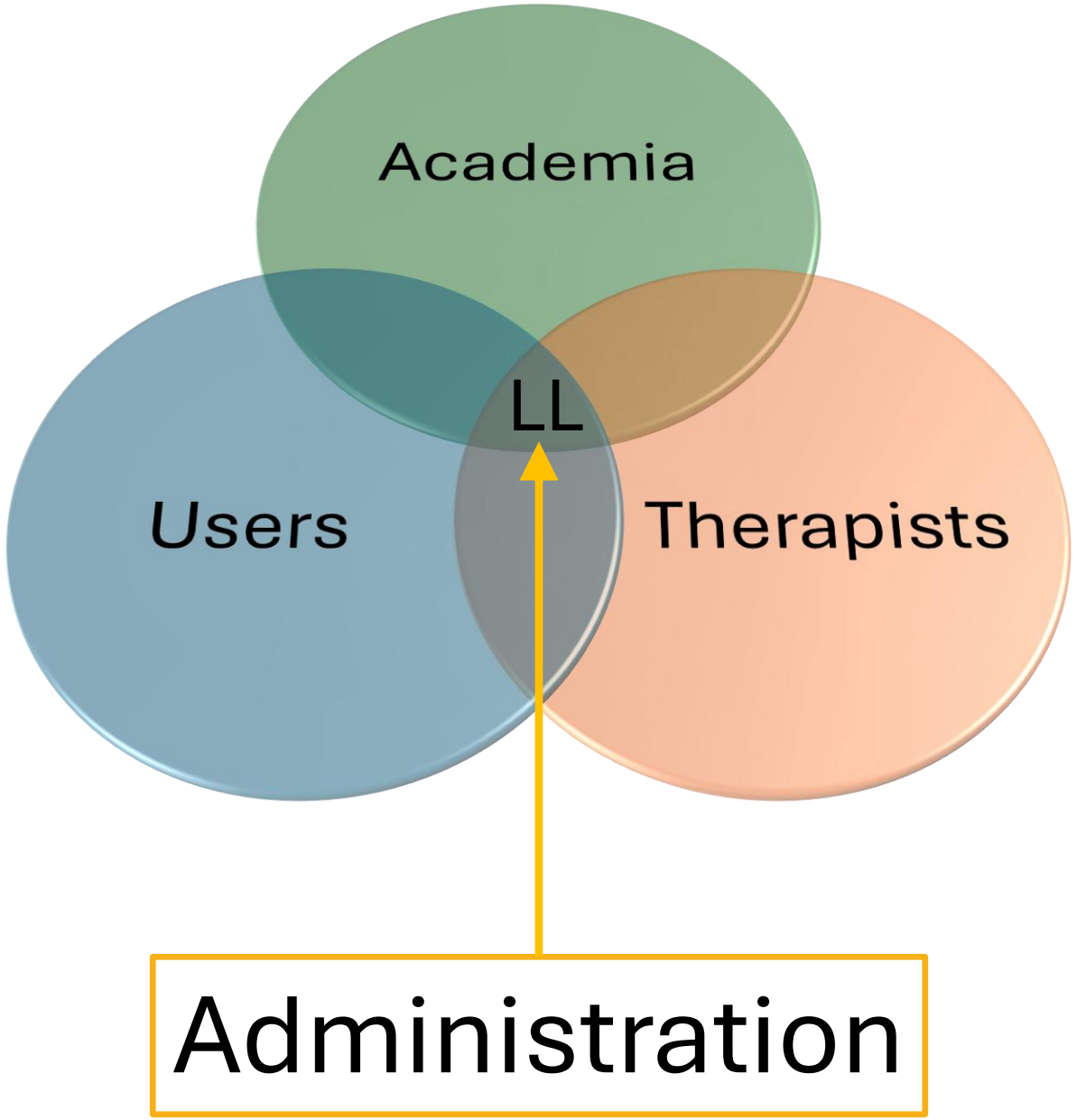
Modern equipment/technology

External recognition

- Governmental entities
- Research community
- General population

Key role

- Defining overarching policies
- Supplying equipment
- Allocating resources
- Unblocking barriers


Academia
LL
Users
Therapists
Administration



Users

170 clients

(Intellectual Disabilities)

Benefits:

- SG designed for their specific needs/interests
- Active participation in research and technology development
  - Social interaction
  - New role

Contributions:

- End-user needs, point of view

Therapists

2 OT's; 2 PT's; 3 Psy

Benefits:

- SG designed for their rehab needs
- Easy access to the SG

Contributions:

- Participation in the SG development
  - Technical feedback and needs
- Theoretical knowledge:
  - Behavior
  - Emotional skills
  - Motor/cognitive skills

Academia

University of Madeira

ARDITI - NeuroRehabLab

Benefits:

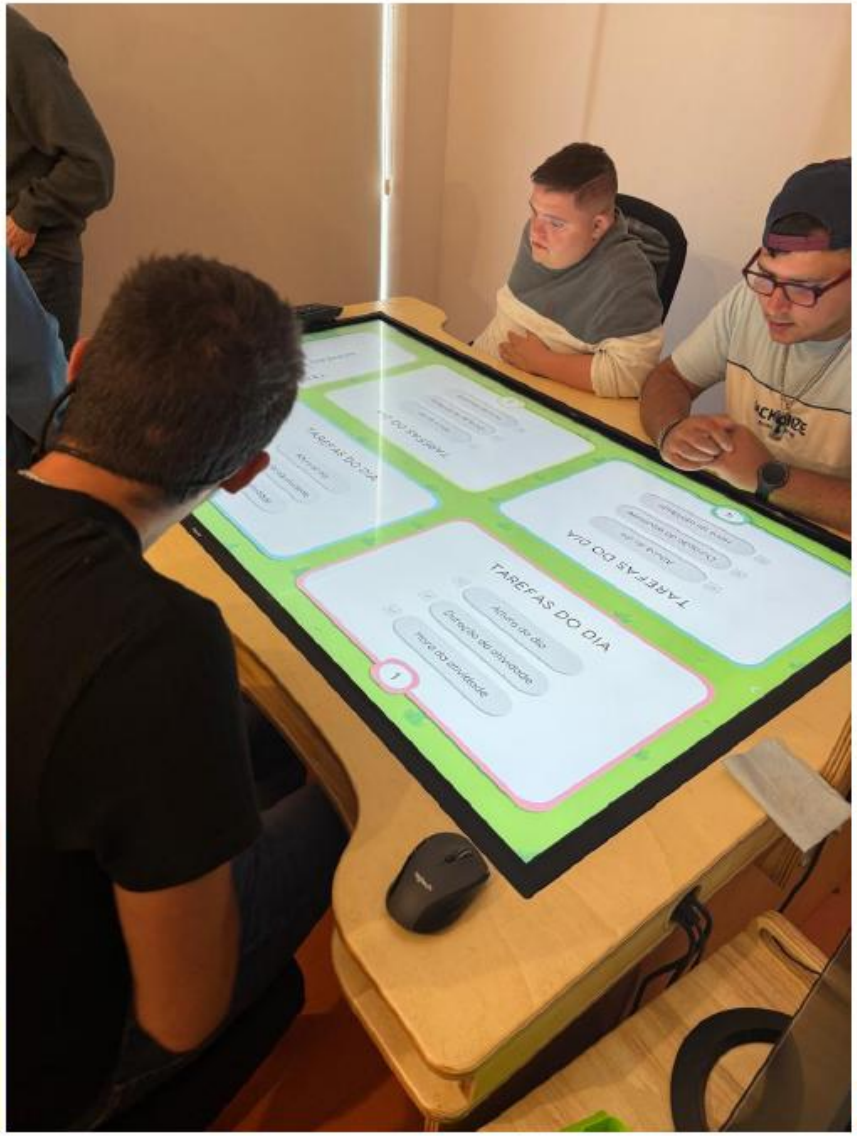
- Bachelor/Masters/PhD thesis supervisions
- Authentic context
- Easy access to end-users and sample
- Go beyond theory (learning opportunity)

→ Increased chance of tech adoption

Contributions:

- Diferentiated skills:
    - Programming, design, data analysis
- Creativity and fresh perspectives
    - New ways of addressing problems
- Challenge established approaches




TAREFAS DO DIA



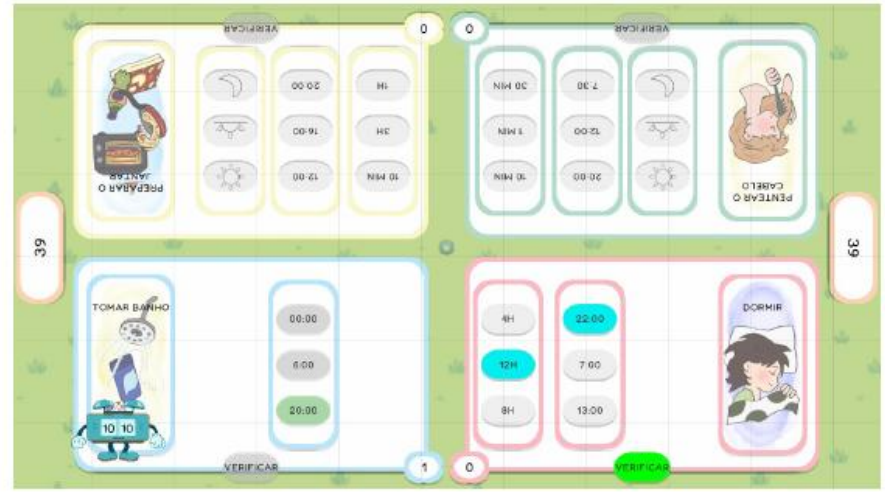



REGRAS DO JOGO
Tick
O Meu Dia,
A Minha Maneira
REGRAS DO JOGO
7PIXEL
+2
+2
+2
PARTIDA
RECEBE UM TICK
COZINHA
QUARTO
SALA DE JANTAR
CASA DE BANHO
SALA
JARDIM
SALA DE JANTAR
SALA DE JANTAR

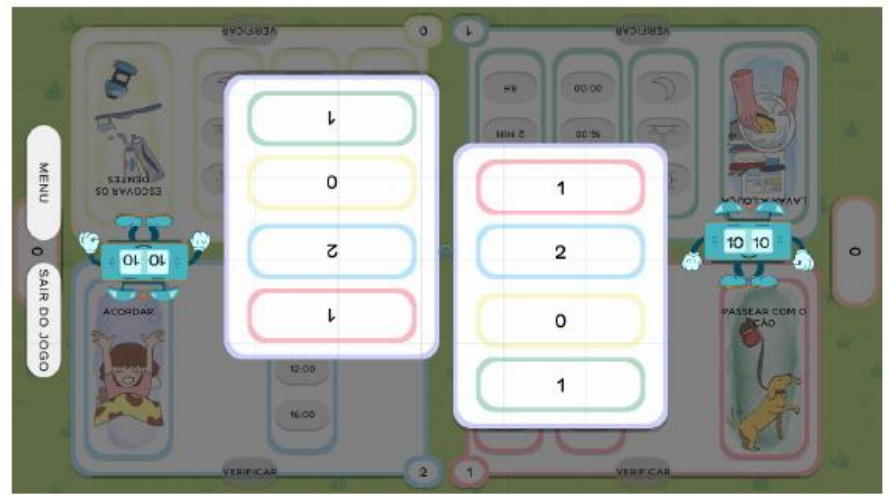
Digital Game














giVE n' TaKE
torna lá, dá cá


0.50 €
0.10 €
0.05 €









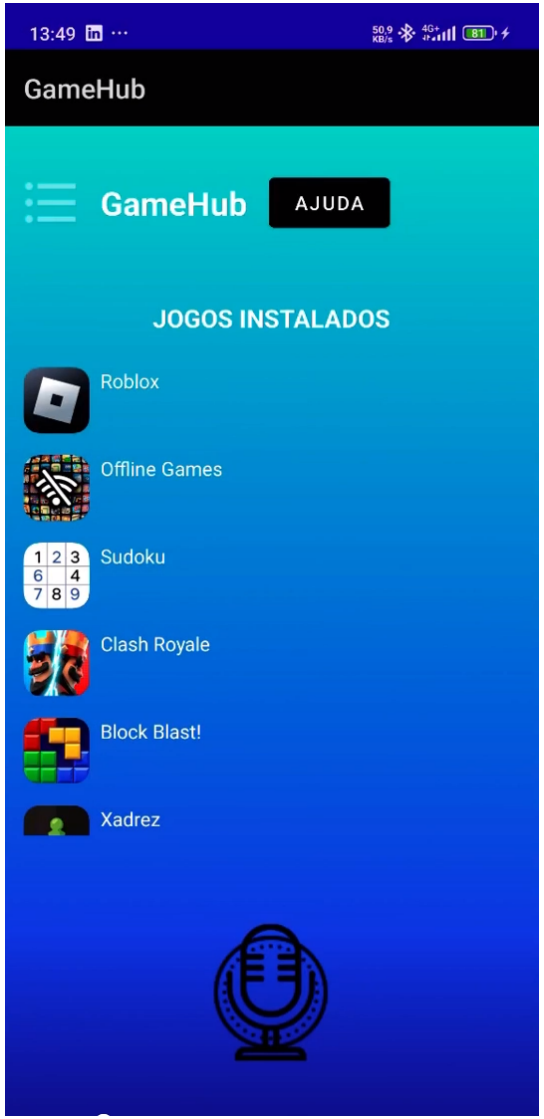
LEVEL 1





LEVEL 2

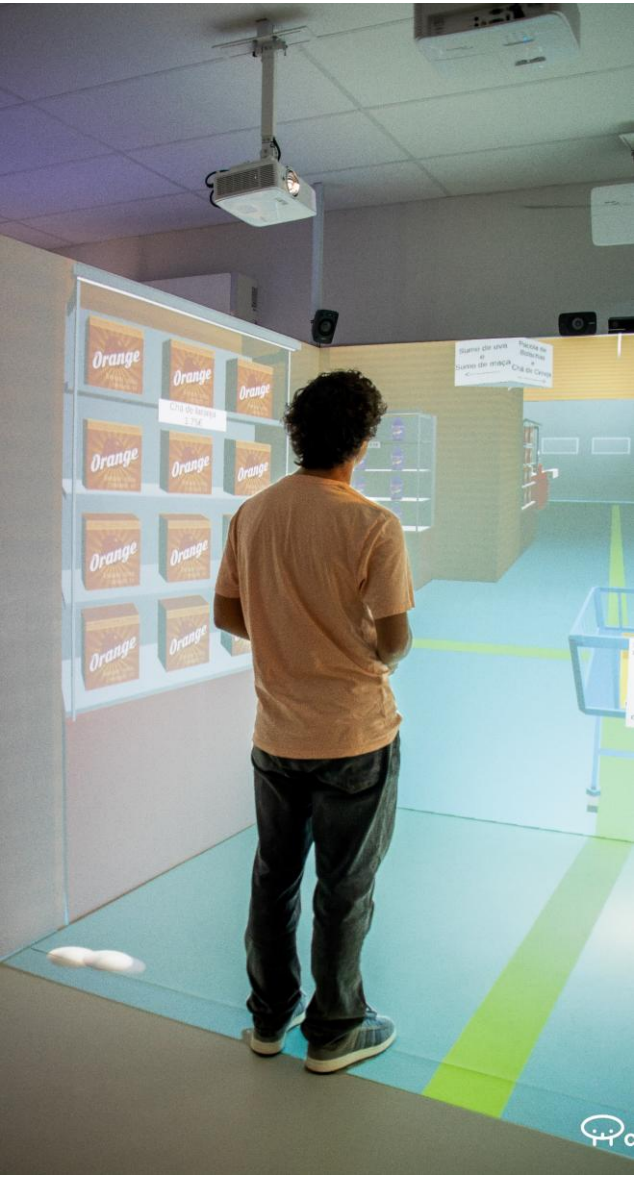
Design of Technologies for Health and Well-being



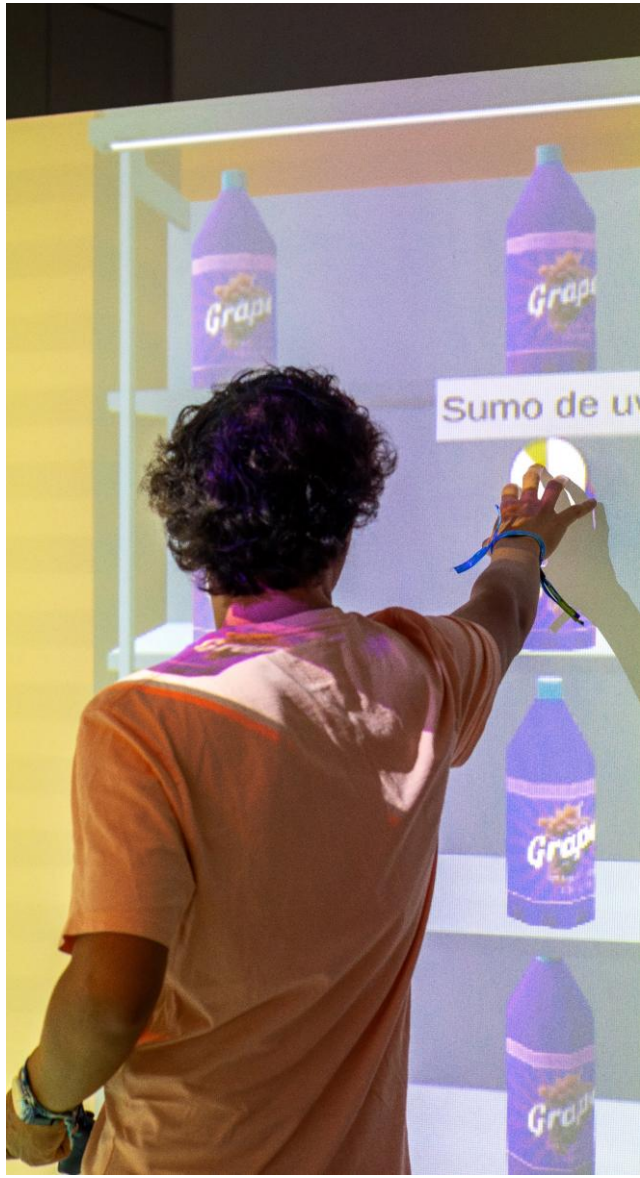
Voice-controlled Gaming Application



Blood Glucose Meter


Orange


SUPERMARKET
1 Pacote de bolachas
2 Chá de cereja
1 Pacote de natas
1 Chá verde
1 Cana Moida
1 Leite
1 Manteiga
1 Sumo de uva
Orçamento restante: 38€


Sumo de uv



Serious Games in Occupational Therapy Practice

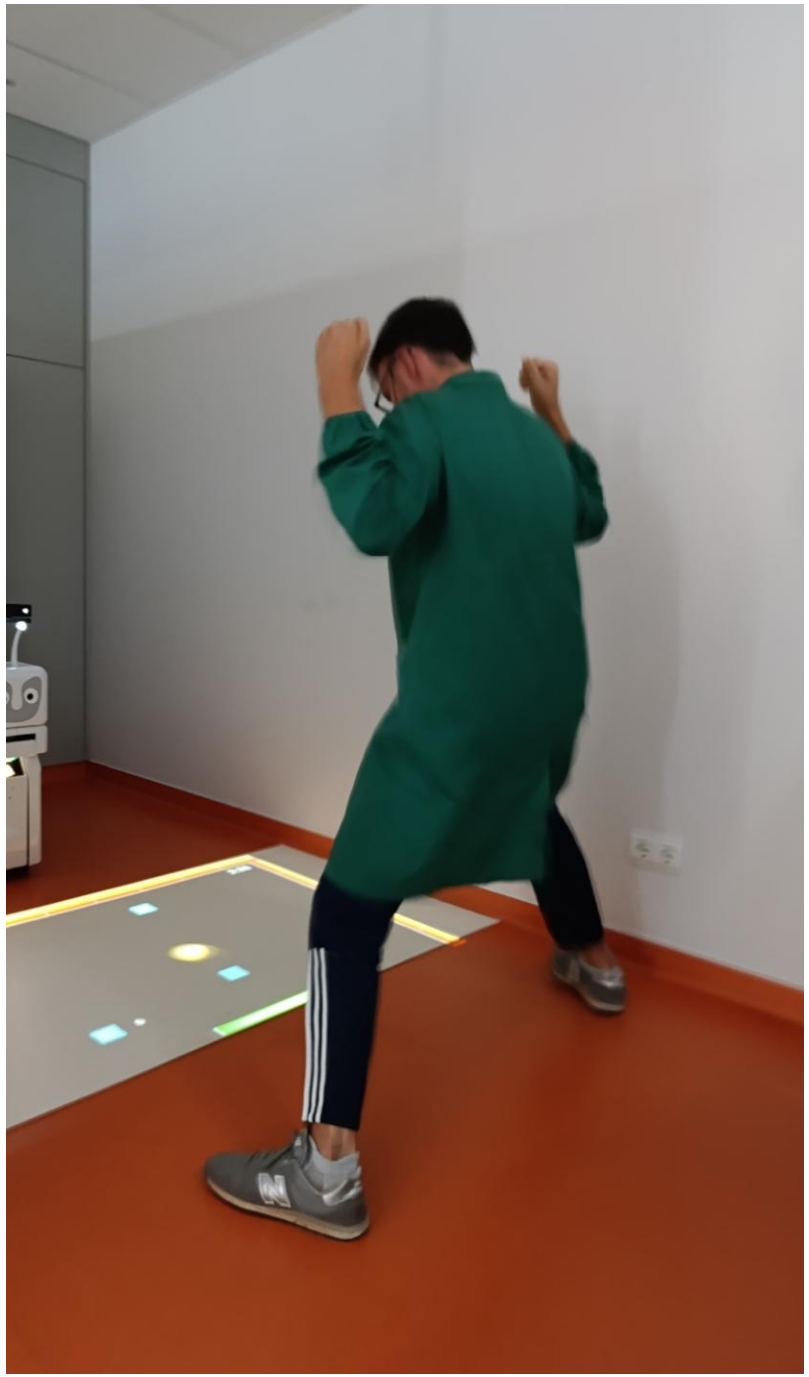



CLASH OF
CHEFS VR


L 20
x1
x0
x0
x0
2
3
4


Pontos
48
20 : 36
Vá ao Parque
MB


Points
36
Go to the
Stamp
Previous
PARQUE
Withdraw
Consults
Payments
1 2 3
4 5 6
7 8 9
. 0 00
CORRECT
CONFIRM
Points
158
28 : 31
Go to the Park
Welcome to the Park
Press Continue



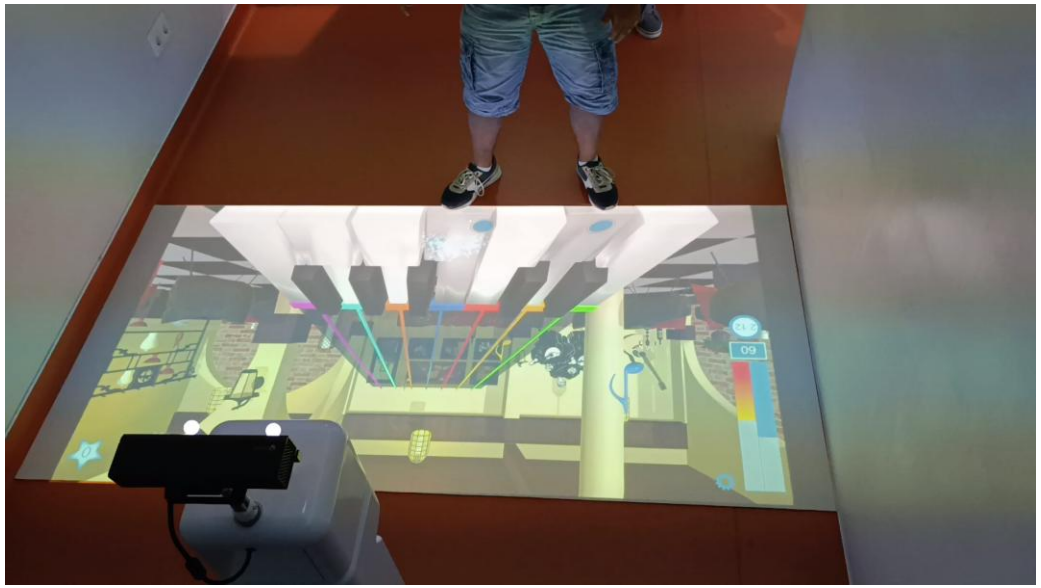


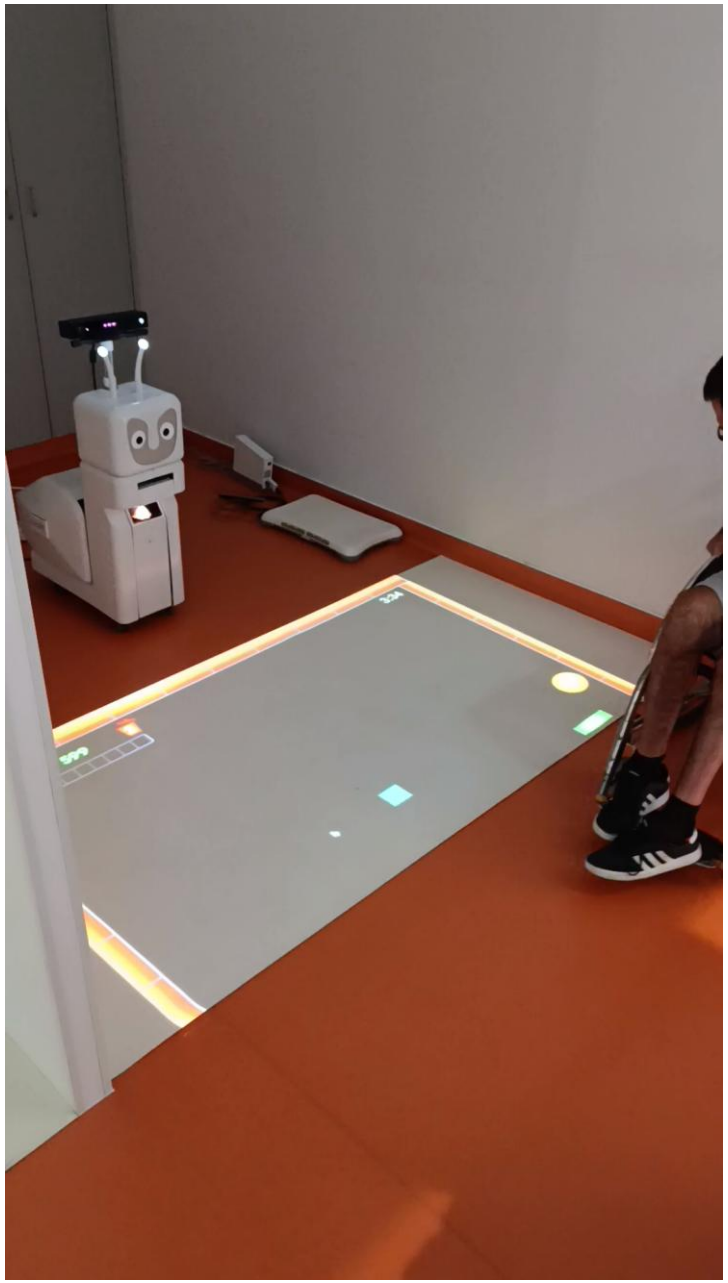




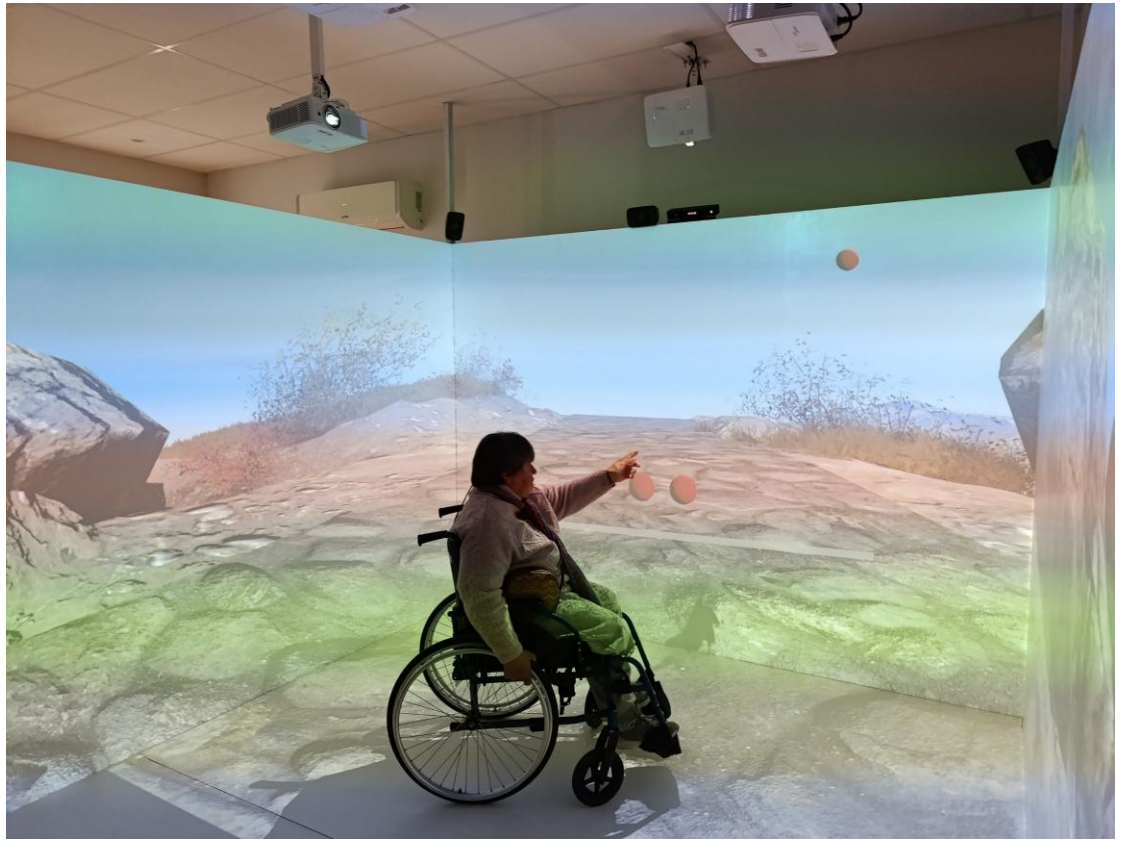


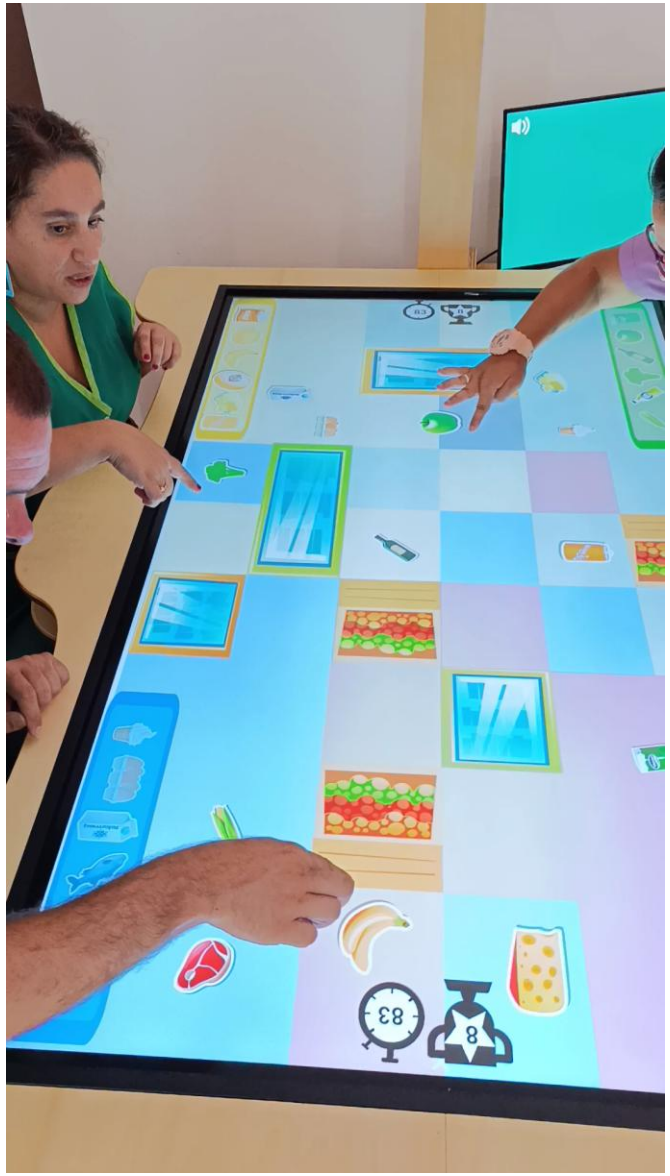
















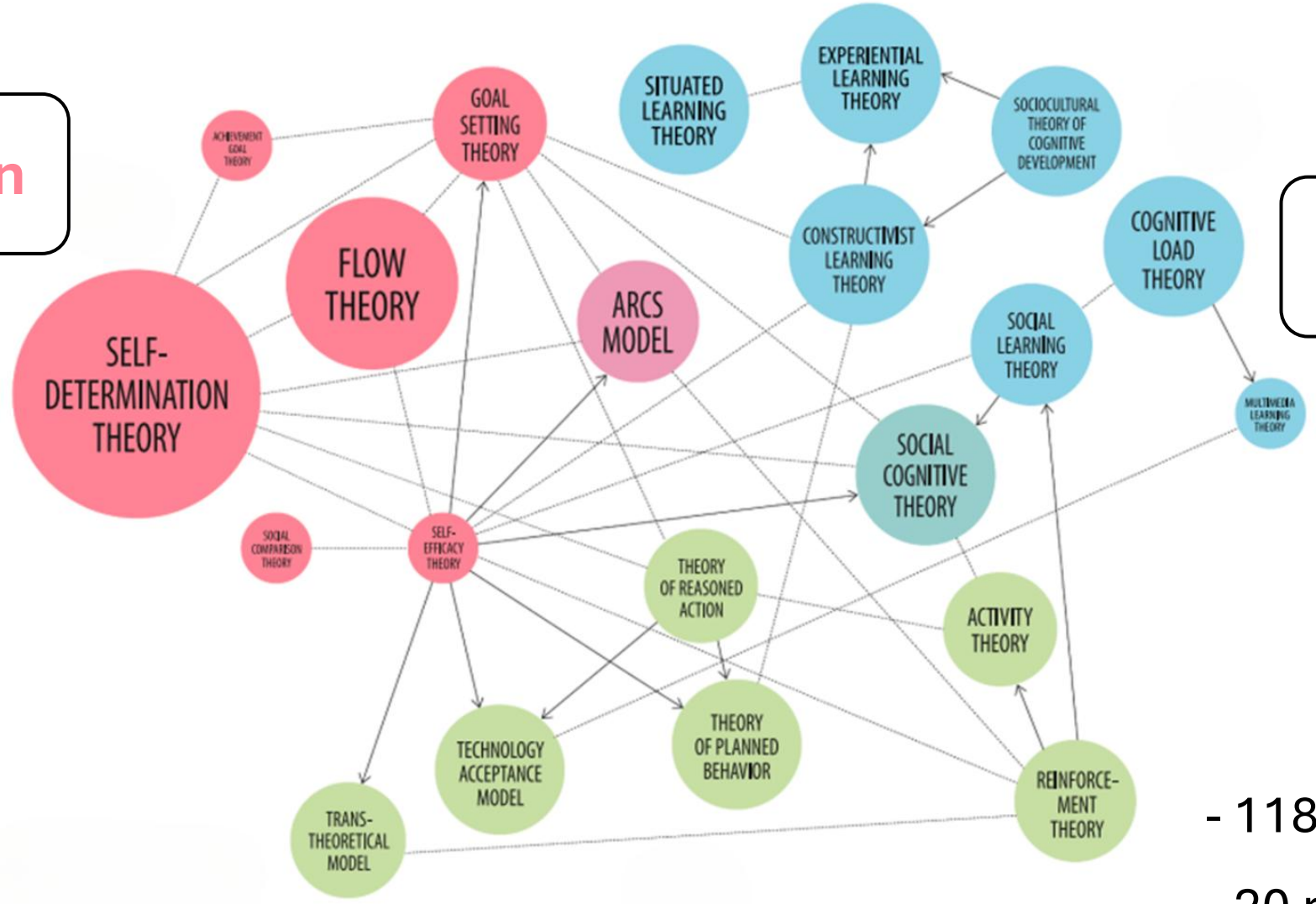
Gamification and Serious Games in OT Education

“Gamification is not effective per se”[1]

Design of effective gamified interventions, requires theoretical knowledge of different mechanisms[2,3,4]:

- Behavior/cognitive
- Emotional
- Motivational

Motivation



Learning

Behavior

- 118 theories
- 20 referenced ≥ 10
- 9 referenced ≥ 23

Image retrieved from “Revealing the theoretical basis of gamification: A systematic review and analysis of theory in research on gamification, serious games and game-based learning“ Krath et al., 2021



Principles that guide towards the intended behavioral outcomes

P1: Clear and relevant goals
Gamification can transparently illustrate goals and their relevance.

P3: Immediate feedback
Gamification can provide users with direct feedback on their actions.

P4: Positive reinforcement
Gamification can reward users for their performance and communicate the relevance of their achievements.

P8: Guided paths
Gamification can nudge users towards the actions necessary for achieving the goals.

P10: Simplified user experience
Gamification systems are usually easy to use and simplify content.

Krath et al., 2021



Principles that foster individual relevance

P2: Individual goals
Gamification can allow users to set their own goals.

P7: Adaptive content
Gamification can adapt tasks and complexity to the abilities and knowledge of the user.

P9: Multiple choices
Gamification can allow users to choose between several diferent options to achieve a certain goal.

Krath et al., 2021

Principles that enable social interaction and positive social effects

P5: Social comparisons
Gamification can allow users to see their peer's perfomance.

P6: Social norming
Gamification can connect users to support each other and work towards a common goal.

Krath et al., 2021



Mandatory to include gamification and serious games on educational curriculums

Establish bridges for multidisciplinary work

- Informatics engineering
- Design
- Digital health

Next step… Clinical Validation (MSc, PhD)




MI–Memory
Cabinets
Game
Competitivo
Colaborativo

9+
0
pontos
9+
0
pontos
60:20
07:09
0
pontos
+6
82
pontos
+6

Biblioteca

Cloud

A descarregar

Filtros: Instalados Não instalados

Ordenar por: Jogados recentemente



MI - Memory Cabi...
1.0.2 main, 1.0.3 main



MI - GiveAndTake
1.0.0 main



MI - Tick
1.0.0 main



ADELO
0.2.3 master, 0.2.5 m...



Training With Mo...
1.0.1 public



Reh@Pong
1.0.0 WithMouse, 201...



ORI Developer To...
2.1.2 Main, 2.1.9 Main



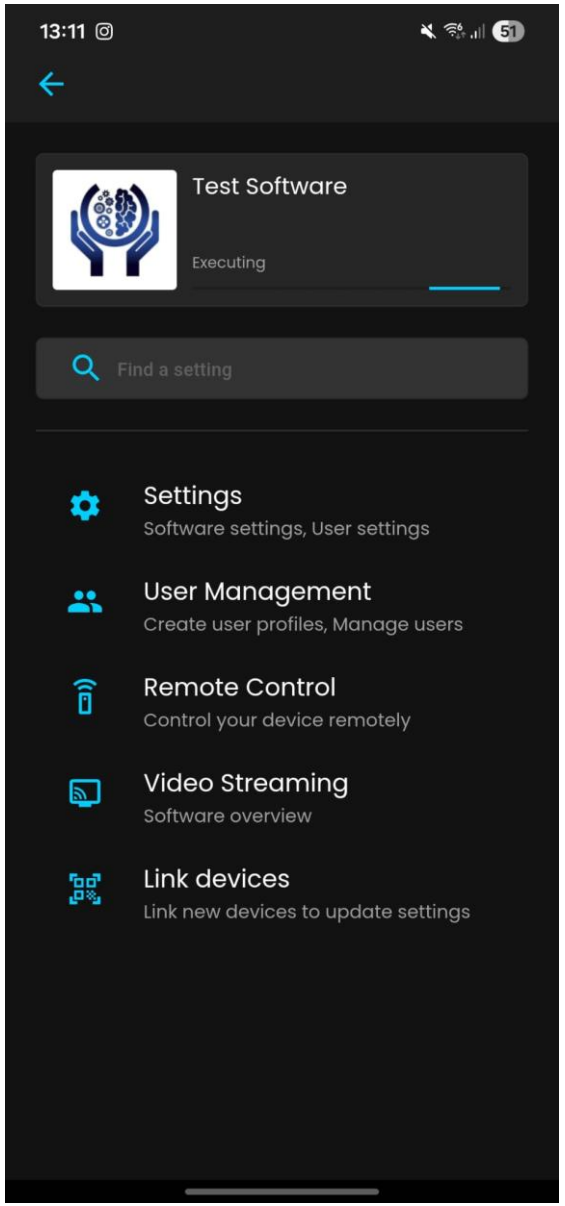
Trail Making Test
1.0.0 main, 1.0.1 main

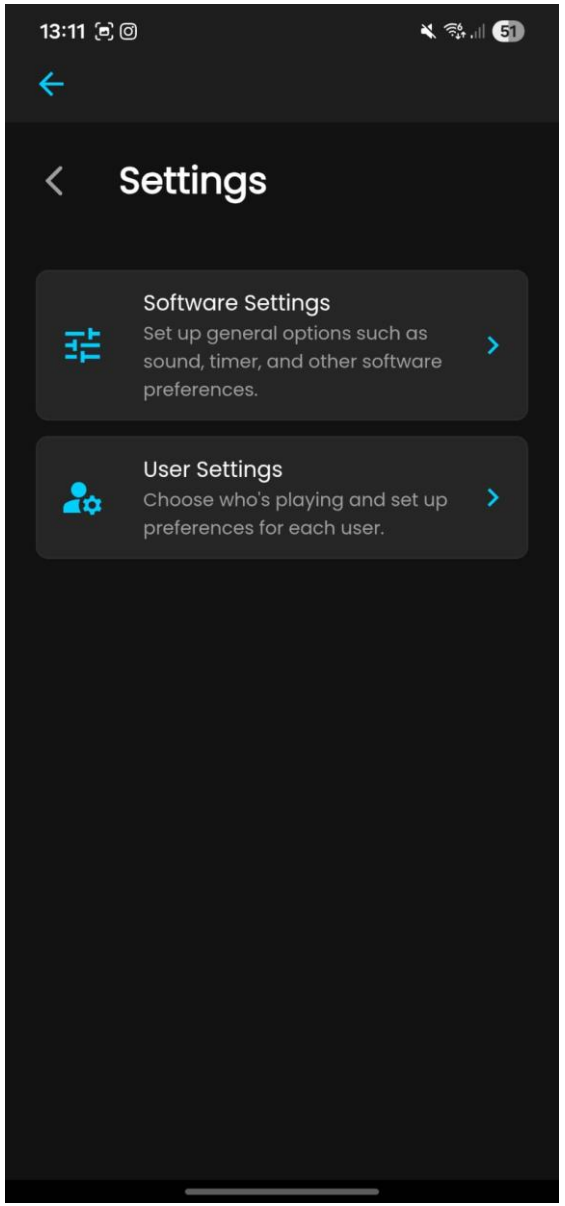


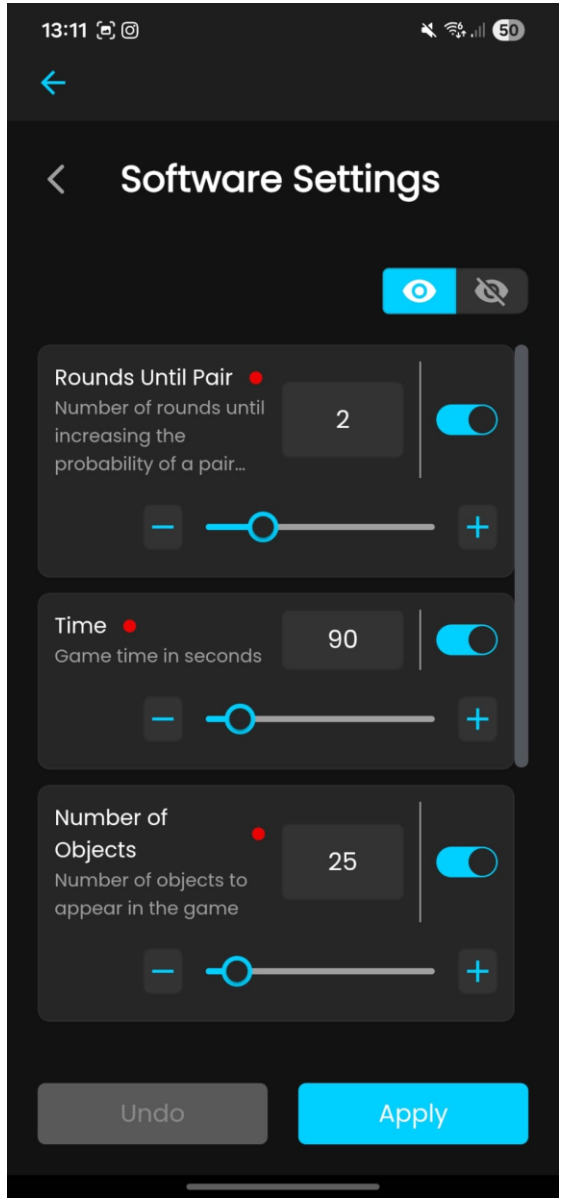
BRaNT
1.21.0 deployment

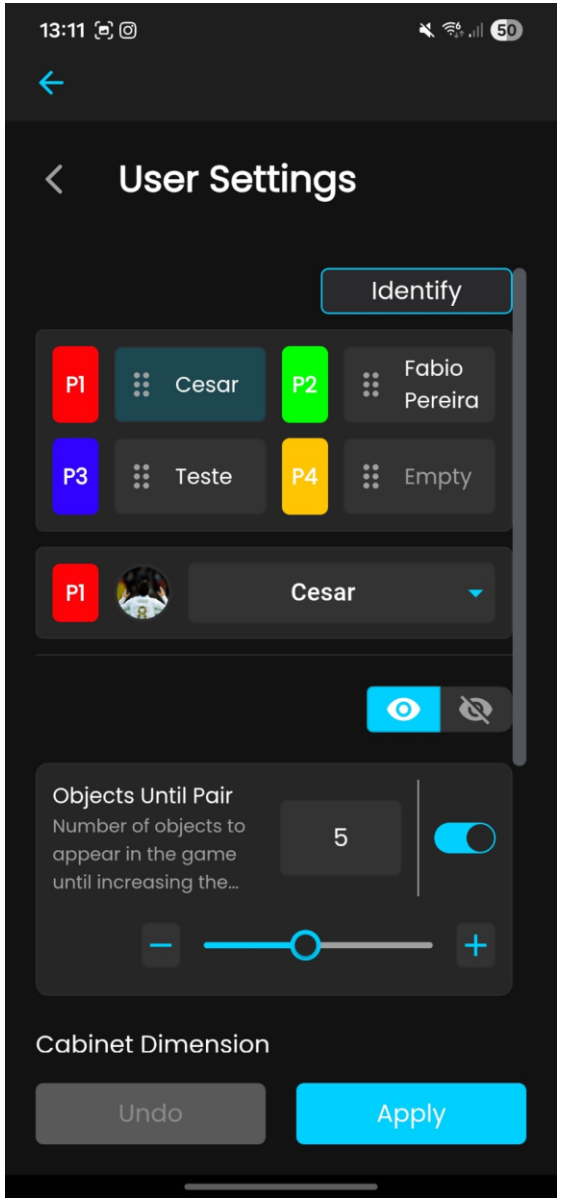


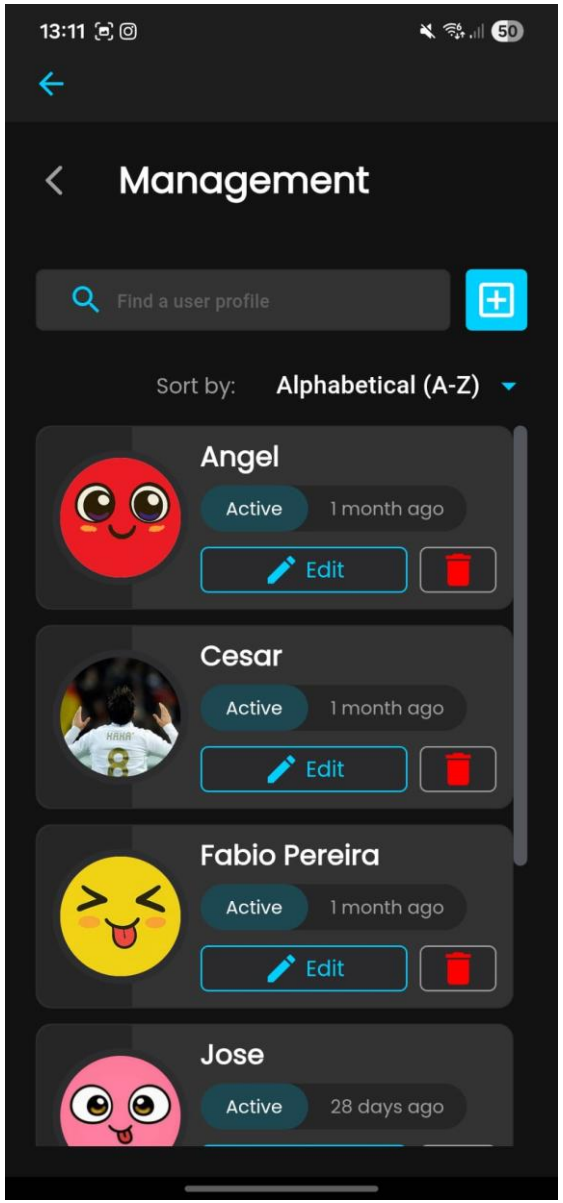
MI - Color Catch
1.0.0 UA, 1.0.56 master

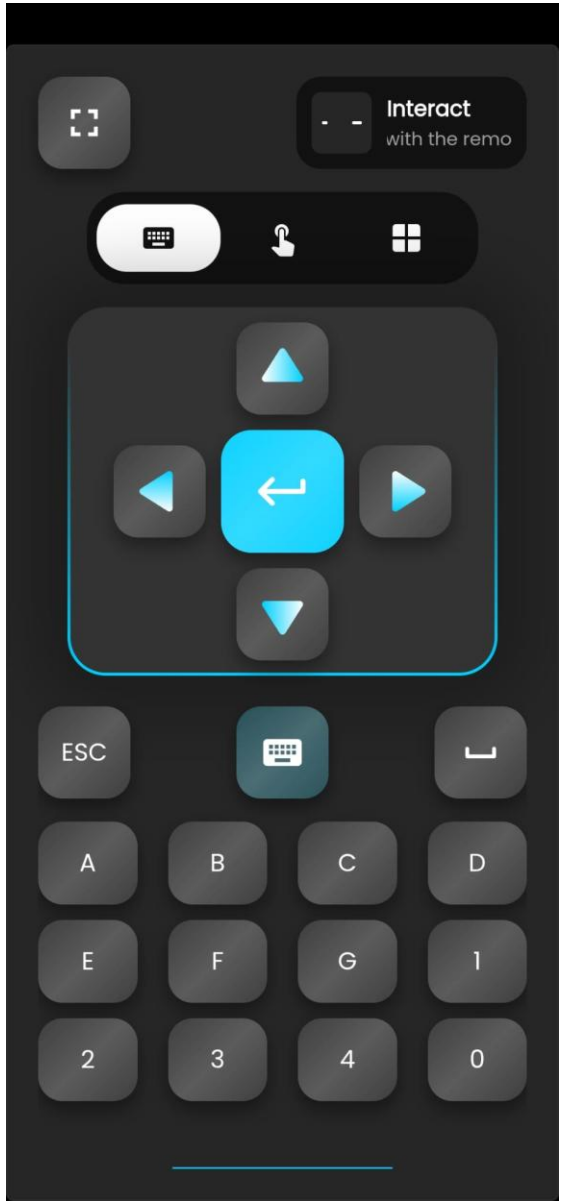

13:11
Test Software
Executing
Find a setting
Settings
Software settings, User settings
User Management
Create user profiles, Manage users
Remote Control
Control your device remotely
Video Streaming
Software overview
Link devices
Link new devices to update settings

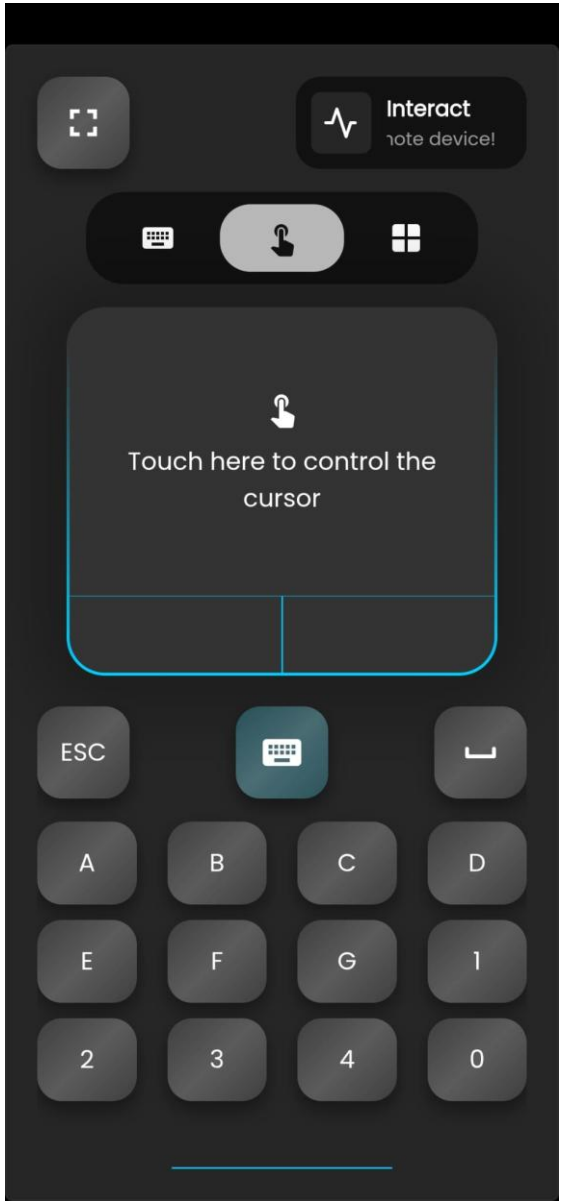

13:11
Settings
Software Settings
Set up general options such as sound, timer, and other software preferences.
User Settings
Choose who's playing and set up preferences for each user.

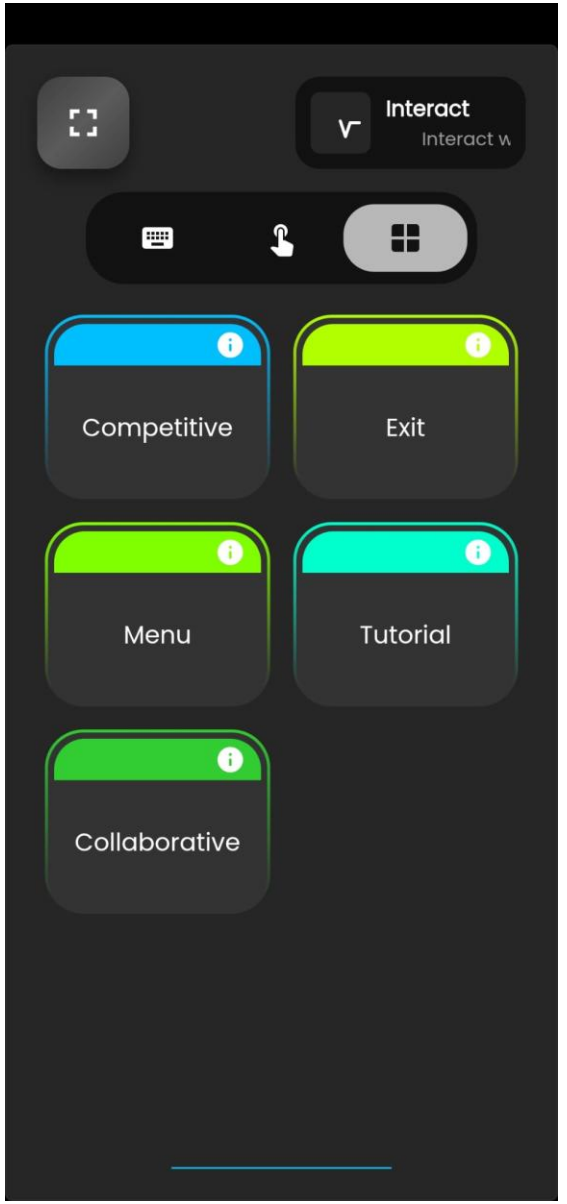

13:11
Software Settings
Rounds Until Pair
Number of rounds until increasing the probability of a pair...
2
Time
Game time in seconds
90
Number of Objects
Number of objects to appear in the game
25
Undo
Apply


13:11
User Settings
Identify
P1
Cesar
P2
Fabio Pereira
P3
Teste
P4
Empty
P1
Cesar
Objects Until Pair
Number of objects to appear in the game until increasing the...
5
Cabinet Dimension
Undo
Apply


13:11
Management
Find a user profile
Sort by:
Alphabetical (A-Z)
Angel
Active
1 month ago
Edit
Cesar
Active
1 month ago
Edit
Fabio Pereira
Active
1 month ago
Edit
Jose
Active
28 days ago


Interact
with the remo
ESC
A
B
C
D
E
F
G
1
2
3
4
0


Interact
Touch here to control the cursor
ESC
A
B
C
D
E
F
G
1
2
3
4
0


Interact
Competitive
Exit
Menu
Tutorial
Collaborative

Take Home Messages



- Personalization and flexibility are keys to the success of serious games for rehab.
- Multidisciplinary work is mandatory to increase chances of developing adoptable technology (SG, …).
- Technology doesn’t replace therapists — it enhances access and improves the quality of training and practice.
- The future of Occupational Therapy lies in the growing integration of digital platforms, AI, and gamification.
- OT’s must be ready to play a role in the development of virtual tools and to use them with efficacy.



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Hotel Vila Galé
Coimbra, Portugal

Thank you!



Fábio Pereira

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Informatics Engineering - HCI

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