



# SERENI Project

Human Interfaces in Information Systems Laboratory

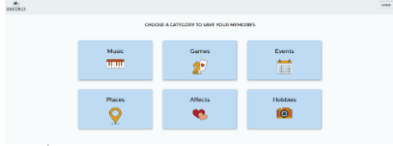
<https://hiis.isti.cnr.it/lab/home>

# Goal of SERENI

- Develop a biographical platform composed by web application and serious games solution integrated into a humanoid robot to enhance cognitive and social functions in older adults, aiming to prolong independent living
- Utilize personalized serious games to engage seniors by creating playful situations that leverage personal memories, fostering interactive experiences
- Include two robot personalities to improve engagement and attention during repetitive cognitive tasks
- Incorporate biographical information into 6 games offering potential benefits in terms of utility and cognitive stimulation
- Conducting two validation phases with game sessions with older adults' groups, recording behaviours and outcomes to fine-tune exercises based on user abilities
- Providing data for caregiver to determine the optimal effectiveness of interactive technology in cognitive stimulation through serious games designed for the older adults.



Biography App gathers  
User Personal Memories



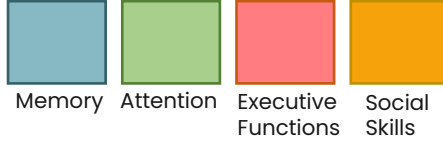
### User Profile

- User personal info & memories
- Chosen games
- Chosen difficulty level
- Session Datagame

AUTOMATIC  
ADAPTATION TO  
PERSONAL LEVEL



BIOGRAPHY-BASED SERIOUS  
GAMES  
FOR COGNITIVE AND SOCIAL  
STIMULATION



### Game Session on Robot



#### Game Data

- Response time
- Completion
- Correct/wrong answers
- Session duration and session data

#### Personality

- Extraverted & introverted personalities
- Improve engagement, attention

#### Biography Data

- Memories
- Favourite music and sports, childhood
- Personalized serious games

# SERENI platform

- Biographical App to collect user personal memories used for personalise games
- Creation of user profile
- Six personalized serious games for training of multiple cognitive domains
- Robot personalities to improve user engagement and attention
- Automatic Adaptation of difficult level according user data sessions

Cognitive and  
Social Assessment



# Trial Test in Train the Brain Programme

Trial (March–May 2023) involved 15 MCI older adults (67 – 88 y.o.) in the clinic of the Train the Brain programme (CNR neuroscience institute) – 428 memories collected

**Goal:** better understand the impact of personalisation in the user experience and the user's game performances vs a non personalized application

- The personalised version seems to stimulate slightly better performance (reaction time, numbers of errors).
- Older adults provided positive feedback, indicating that interacting with the robot and the memory-based games evoked a range of emotions, and triggered recollections of past experiences.

Personal memories can play an important role compared to the use of other general knowledge information for the game content

## The Games

Memory completion  
Activities ordering  
Memories association  
Memory-related event question  
Music game  
Memory game



# User Trail Video

