**Major objectives**

Develop a Mental Wellness Toolset (MWT) for individual use to:
- provide cognitive training for elderly persons in entertaining ways by computer games;
- recognize, measure and visualize eventual significant changes in their cognitive abilities over time;
- issue polite early warnings about changes to those directly or indirectly effected.

Develop Community Building Tools (CBT) for:
- health-aware persons and their families;
- professionals providing care for elderly people with declining mental abilities.

**Social and economic aspects**

- World’s elderly population is continuously growing accompanied with specific health problems and diseases of ageing people.
- Costs of health services and care might be reduced significantly by the early detection of the Alzheimer’s disease and other dementias.

**Early pilot**

**Goals of Early Pilot**
- develop and test ideas
- implement and evaluate different games
- set-up experimental architecture
- deploy development technology (Java in offline mode)
- build communities of test persons (elderly home, clinics, home care environment)

**Results of Early Pilot**
- eleven games implemented
- test groups created (total 62 persons, average age 70 years; 49 healthy, 13 MCI-diagnosed)
- more than 100,000 game logs collected and processed
- relation of neuropsychological functions and user performance while playing games studied further
- lots of useful feedbacks received from end users influencing further developments

**Scientific aspects**

**Scientific goal**
- Evaluate serious games as tools for measuring cognitive decline.

**Method**
- 55 elderly subjects were enrolled during the Early Pilot.
- They were assessed by a standard neuropsychological test battery, the Addenbrooke’s Cognitive Examination (ACE); the Ray Verbal Learning Test (RAVLT); and the Trail Making A and B.
- They were examined by structural magnetic resonance imaging (MRI).
- They played the serious games provided by the MWT.
- Their psychiatric status was measured by taking the medical history and by using the Geriatric Depression Scale (GDS) and the State Anxiety Inventory (STAI).

**Rationale**
- The measurements mentioned above proved to be good predictors of Mild Cognitive Impairment (MCI) and dementias in previous investigations.

**Early results**
- High correlations (p<0.01) were found between the results of the neuropsychological tests, the size of the hippocampi and the game performance (see Figure).
- It indicates that serious games can be useful tools in the early detection of Alzheimer’s dementia.

**Current status and next steps**

**Current status**
- new online MWT with almost 20 games
- online player registration open to everybody after completing a Paired Associate Learning test
- controlled cognitive training sessions held at Semmelweis University, Budapest
- improved internationalization and localization
- changed development technology with JavaScript and HTML5, allowing development also for mobile devices

**Next steps**
- develop more and challenging online games with attractive web design
- improve compatibility of the data produced by the games
- simple but motivating feedback to end users
- involve more end users, increase their motivation and interest
- extend data evaluation and prediction experiments