The place of ICT for the assessment & stimulation

FORUM SCIENTIFIQUE CHILI - FRANCE

Through the study of these topics, and thanks to a core of disciplinary excellence, these academies will generate the trans-disciplinary approach that is still lacking in French universities. UCA JEDI will also provide an effective connection and interactivity between fundamental research and innovation, by means of its three Reference Centers, set up in order to respond to three major societal challenges, targeted in a top-down approach, in close relationship with the territory and its local authorities:
- Health, well-being and aging;
- The intelligent territory; prevention and management of risk;
- The digital challenge.

UCA JEDI: Joint, Excellent and Dynamic Initiative

The IDEX UCA JEDI candidacy is coordinated by the Université Côte d’Azur (UCA), a Community of Universities and Establishments (ComUE), comprising:
- The Université Nice Sophia Antipolis (UNS), research-intensive, present in all international rankings;
- Two National Research bodies: CNRS and Inria, multidisciplinary and emblematic in digital sciences, respectively;
- The Observatoire de la Côte d’Azur (OCA), one of the three French SPU establishments, with a strong commitment to international projects;
- The Centre Hospitalier Universitaire (CHU) of Nice, a leading national center for simulation and innovation in hematology, biological resources and therapies;
- EDHEC and SKEMA, two Business Schools present in all international rankings;
- A consortium, into a college, of six Art Schools, active on the international scene: Centre National de Création Musicales, École Nationale Supérieure d’Art Villa Arson, École Supérieure de Réalisation Audiovisuelle (ESRA), The Sustainable Design School (SDS), École Supérieure de Danse de Cannes Rosellia Hightower, Conservatoire National à Rayonnement Régional de Nice (CNRR).

In addition to the 13 members of the UCA, the candidacy also includes as partners, by agreement, INSERM, INRA, IRD, the MINES ParisTech (for its site at Sophia Antipolis) and EURCEM. The scope of UCA JEDI thus brings together all the public and private entities of higher learning and research, well-known and visible on the international scene, that are present on the Côte d’Azur.

The UCA JEDI strategy rests on three pillars: (i) an ambitious and disruptive scientific vision; (ii) an uninhibited relationship with local authorities and companies, dedicated to the economic dynamics of the territory; (iii)
MAINS OBJECTIVES

• 1/ To develop clinical and translational researches using ICT in order to prevent, help to diagnose and assist patients suffering from neuropsychiatric & neurodevelopmental disorders
  – Monitoring and assessment
  – Interventions to provide individualised care
• 2/ To develop scientific networks between clinical teams of the CHU Nice, School of Medicine and the INRIA units
**mNC³**

**Médecine Numérique Cerveau Cognition Comportement**

**Asclepios**

Digital Medicine: Brain, Cognition, Behavior

Médecine Numérique: Cerveau Cognition Comportement

**Clinic Test / sensors**

- Promoting the use of information and ICT to improve diagnosis, treatment and follow-up of neurological and psychiatric diseases
- Integrating heterogeneous data
- Promoting educational programs to connect different disciplines

**Imaging**

- PET / MRI

**Biology Genetic**

**Research programs**

- FP7 Dem@Care
- FP7 Verve
- FP7 in MinDD
- Az@game
- H20 20 SensCog

**VERVE**

- Vanquishing fear and apathy through E-relations
- Personalised and populated Realistic Virtual Environments for clinical, home and mobile platforms

**Clinic**

- Needs finding
- Needs screening
- Concept generation
- Concept selection
- Developm. Strategy & planning
- Integration

**IDENTIFY**

**INVENT**

**IMPLEMENT**

**August 28 - September 2, 2017**

**FP7 Dem@Care**

**FP7 Verve**

**FP7 in MinDD**

**Az@game**

**H20 20 SensCog**

**Troubles des cognitions**

- Mémorie
- Langage
- Attention / concentration
- Utilisation des gestes

**Trouble du comportement**

- Agitation
- Agressivité
- Apathie
- Dépression / anxiété

**PERTE DE L'AUTONOMIE ET DE L'ADAPTATION À LA VIE QUOTIDIENNE**
Night time activity in AD with & without Apathy - 7 days

AD - No Apathy

AD - Apathy

Mulin & al, JAD, 2011
**ADL ecological assessment**

Session 1: Feb 2011: 1 month before DBS
Session 2: Jul 2011: 3 months after DBS

**Obtained parameters by the video signal:**
- Participant’s global trajectory during a free period
- Study of the level of interaction between participant and static environmental objects

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<td>MMA</td>
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</table>

Object manipulation (OM) and OM in goal-oriented zones (GOZ) but not for frequency of zone displacement (FZD).

**Video Sensor**

Facial expression recognition during emotional task

- Input Video
- Face Detection
- Improved Facial Features
- Facial Activity / Expression Recognition
- Talking
- Singing
- Neutral
- Smiling

- Frequency of zone displacement (each zone represents a different colour):  
  * Goal-oriented zones (related to a designated activity)  
  * Neutral zones (unrelated to an activity)
Task category: list of discrete words  Example: fluency – animals

The fluency and free speech tasks obtain the highest accuracy rates of classifying AD vs. MD vs. MCI vs. HC.
• A - Apathy as a disorder of Motivation
• B - Symptoms in 3 main domains
  Behavior
  Cognition
  Emotion
  Initiation
  Response
  Initiation
  Response
  Initiation
  Response

C - Consequences

D – Criteria for a differential diagnosis

GAMES

Sensors
  Audio
  Motor
  Video
  Sensors & Games integration

Imaging
  Merging Imaging sensors, Games clinical data

MoTAP

mNC3

Stimulation

Sensors
  Audio
  Motor
  Video

Imaging
  Merging Imaging sensors, Games clinical data

Games vs criteria

IOT

Validation

Centre Edmond et Lily Safra

CENTRE TEMPLE GARDEN

CENTRE EMOND ET LILY SAFRA
Recommendations for the Use of Serious Games in Neurodegenerative Disorders: 2016 Delphi Panel

MeMo open on April 2015. As today more than 36,000 training sessions

http://www.memory-motivation.org/
**ETUDE XTORP**
3 séances par semaine durant 4 semaines

Xtorp permet aux patients de réaliser des activités motrices et cognitives d’une manière soutenue et progressive pendant une période de 1 mois.

**Une amélioration des performances Physiques**

**Cognitives**

Le maintien de la motivation

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**Physical and Cognitive Stimulation Using an Exergame in Subjects with Normal Aging, Mild and Moderate Cognitive Impairment**

Manera & al, PLOS One, 2016

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**Acceptability of a VR solution for patients MCI and AD to stimulate attention and concentration**

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**Immersion virtuelle et sensorielle combinant: RV, le son et l’odeur (collier olfactif)**

1. Point de départ à partir de l’état de base de la personne (situation réaliste).
2. Envol sur une île: début de l’immersion.
3. Réduction progressive.
4. Phase basse: relaxation maximale avant retour à la réalité.

REL@X
Relaxation par utilisation de la réalité virtuelle et régulation émotionnelle chez des patients avec ou sans troubles cognitifs légers.
Formation du personnel en EVC

#APPRENDRE #ÉCHANGER #JOYER

Aidant & ÉVC s’adresse aux adosés naturels de patients souffrant de la maladie d’Alzheimer ou d’une pathologie associée afin de mieux les connaître et les accompagner au quotidien.

Forum
Un lieu d'échange et de partage entre aidants naturels et proches.

Serious Game
De nombreuses ressources pour permettre de mieux appréhender les situations de crise.

Bibliothèque
De nombreuses ressources pour permettre de mieux appréhender les situations de crise.

Lien vers le site web : http://www.aidant-et-eve.fr