



# HEAD

(Human Empowerment  
Aging and Disability):

*tecnologie e rete per  
tele-servizio di  
riabilitazione*



**262M** di anziani – eta' media crescente

**861M** Pazienti cronici, 50% esiti negativi

**75-85%** speso per la gestione delle malattie croniche

**% Pil investito** in sanita' crescente



Local Governments



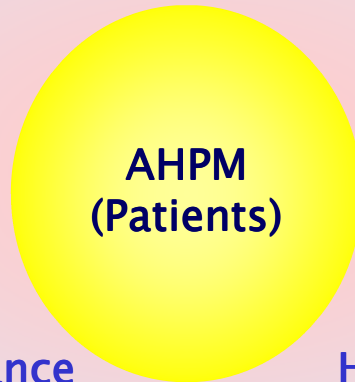
Healthcare Structures

Patient Care Needs

Health Care Resources



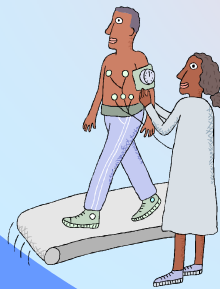
Healthcare System



AHPM (Patients)

Performance Measurement

Hospital Costing-Based System



Care Givers



Supplier

STAKEHOLDER PERSPECTIVE

# HORIZON 2020 HORIZON 2020

the EU framework programme for  
research and innovation

# ICT in (one of) Societal Challenges

## Health, demographic change & wellbeing

- e-health
- self management of health
- improved diagnostics
- improved surveillance
- health data collection
- active ageing
- assisted living



I want to  
grow old at home



**older &  
bolder**

Tel: 01 8783623

Support equality for older people  
Find out how [www.olderandbolder.ie](http://www.olderandbolder.ie)



# HEAD gli attori





# Il progetto

**processi di cura riabilitativa**

*con i correlati di assistenza sanitaria e sociale*

**per condizioni di disabilità croniche**

*determinate da lesioni congenite o acquisite*

**del sistema nervoso**

World Health Organization

Classification Assessment Surveys & Terminology Group



**International Classifications**

[www.who.int/classification/icf](http://www.who.int/classification/icf)

# ICF Components

## Body Functions & Structures



*Functions*

*Structures*

## Activities & Participation



*Capacity*

*Performance*

## Environmental Factors



*Barriers*

*Facilitators*

# Medical *versus* Social Model

- |                         |    |  |
|-------------------------|----|--|
| • PERSONAL problem      | vs | SOCIAL problem                         |
| • medical care          | vs | social integration                     |
| • individual treatment  | vs | social action                          |
| • professional help     | vs | individual & collective responsibility |
| • personal adjustment   | vs | environmental manipulation             |
| • behaviour             | vs | attitude                               |
| • care                  | vs | human rights                           |
| • health care policy    | vs | politics                               |
| • individual adaptation | vs | social change                          |

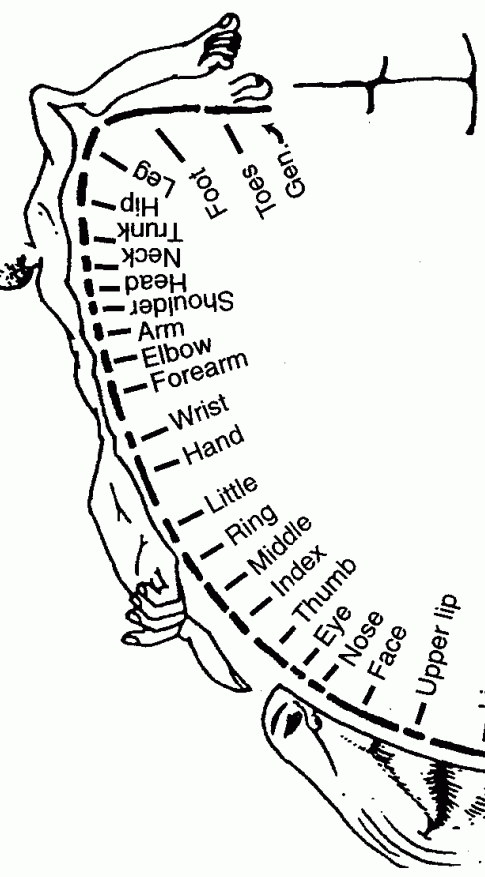
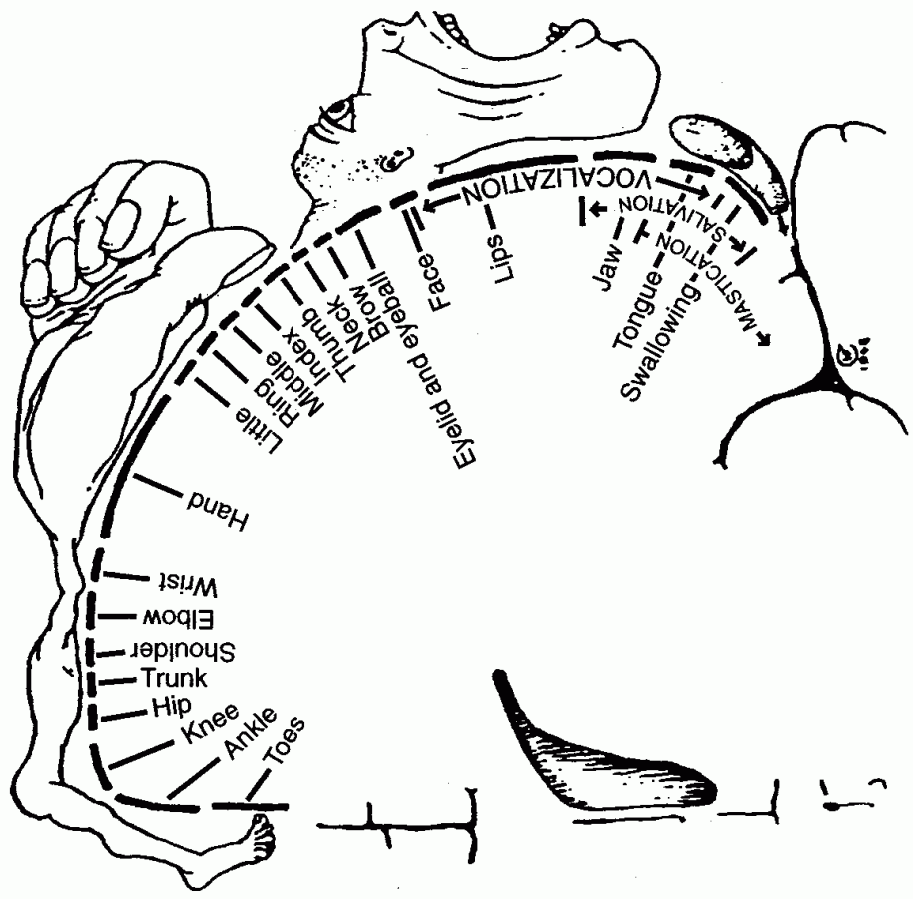
**contestualizzati**

**individualizzati**

**con uso innovativo di tecnologie**

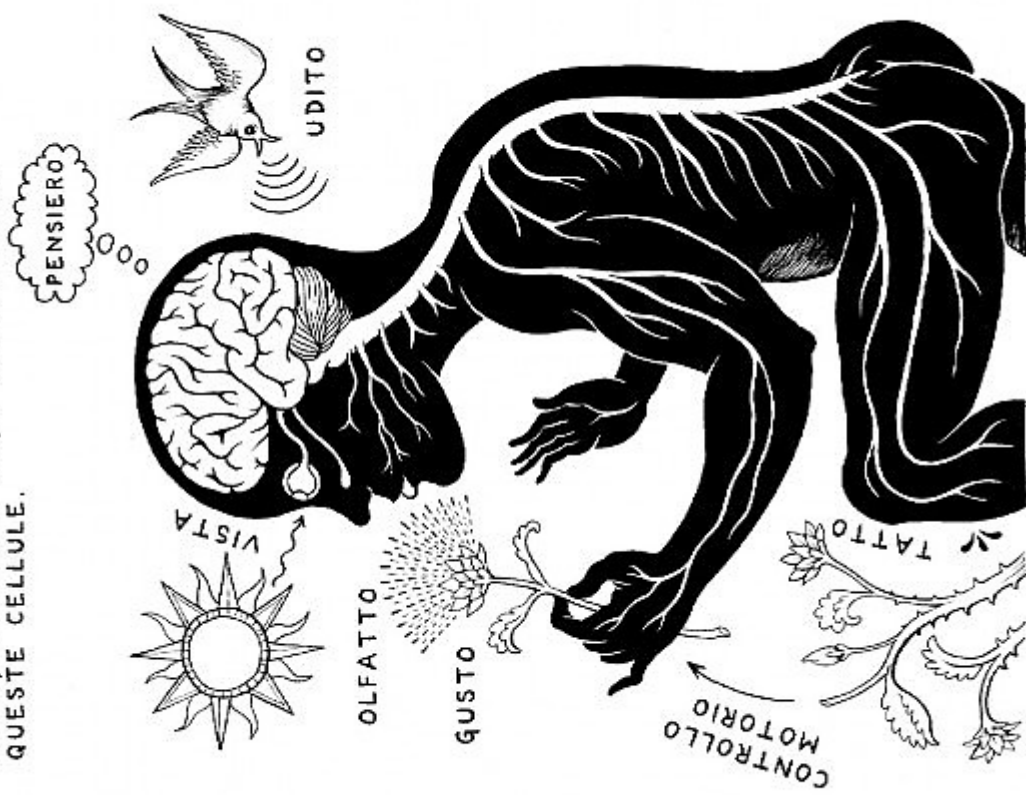


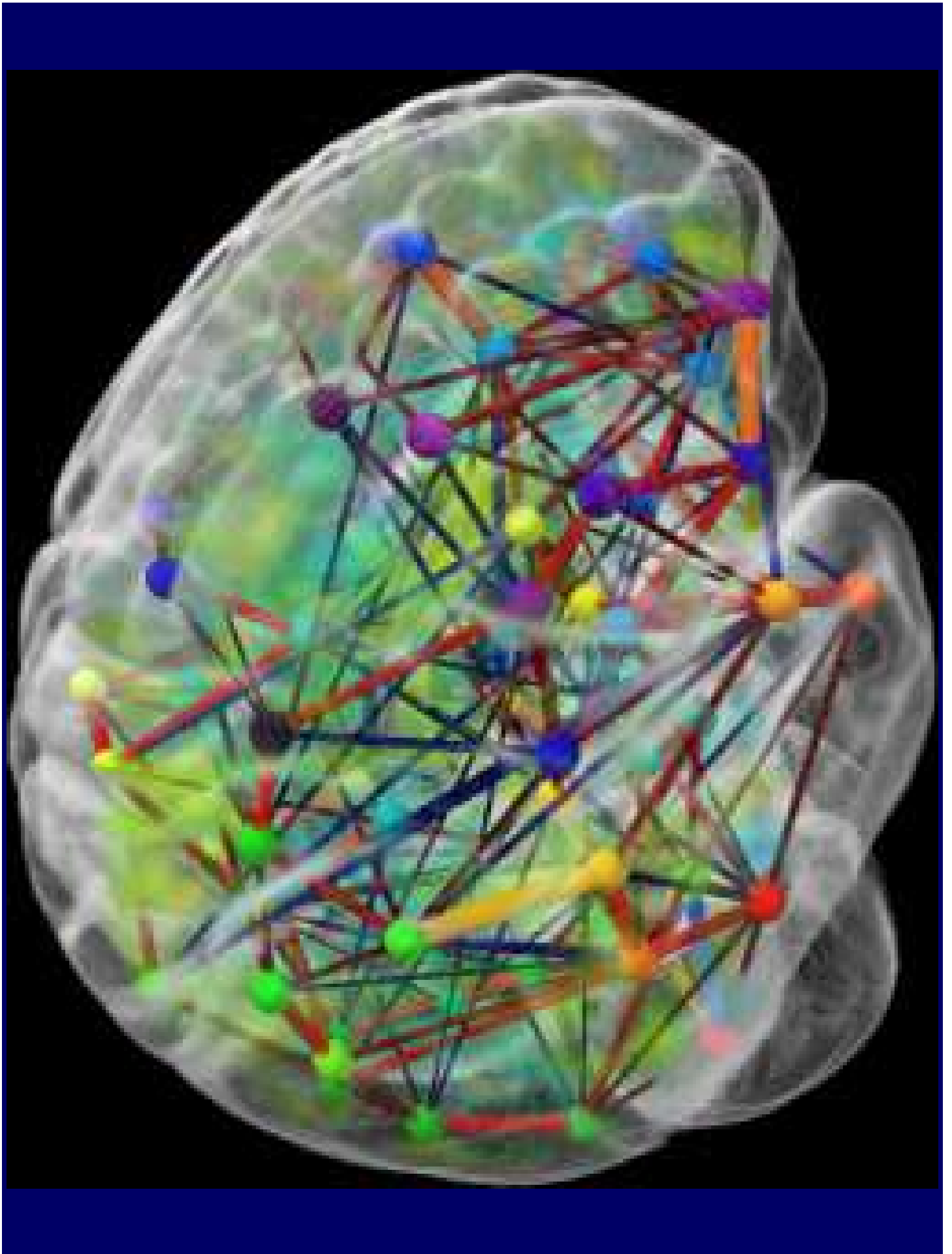




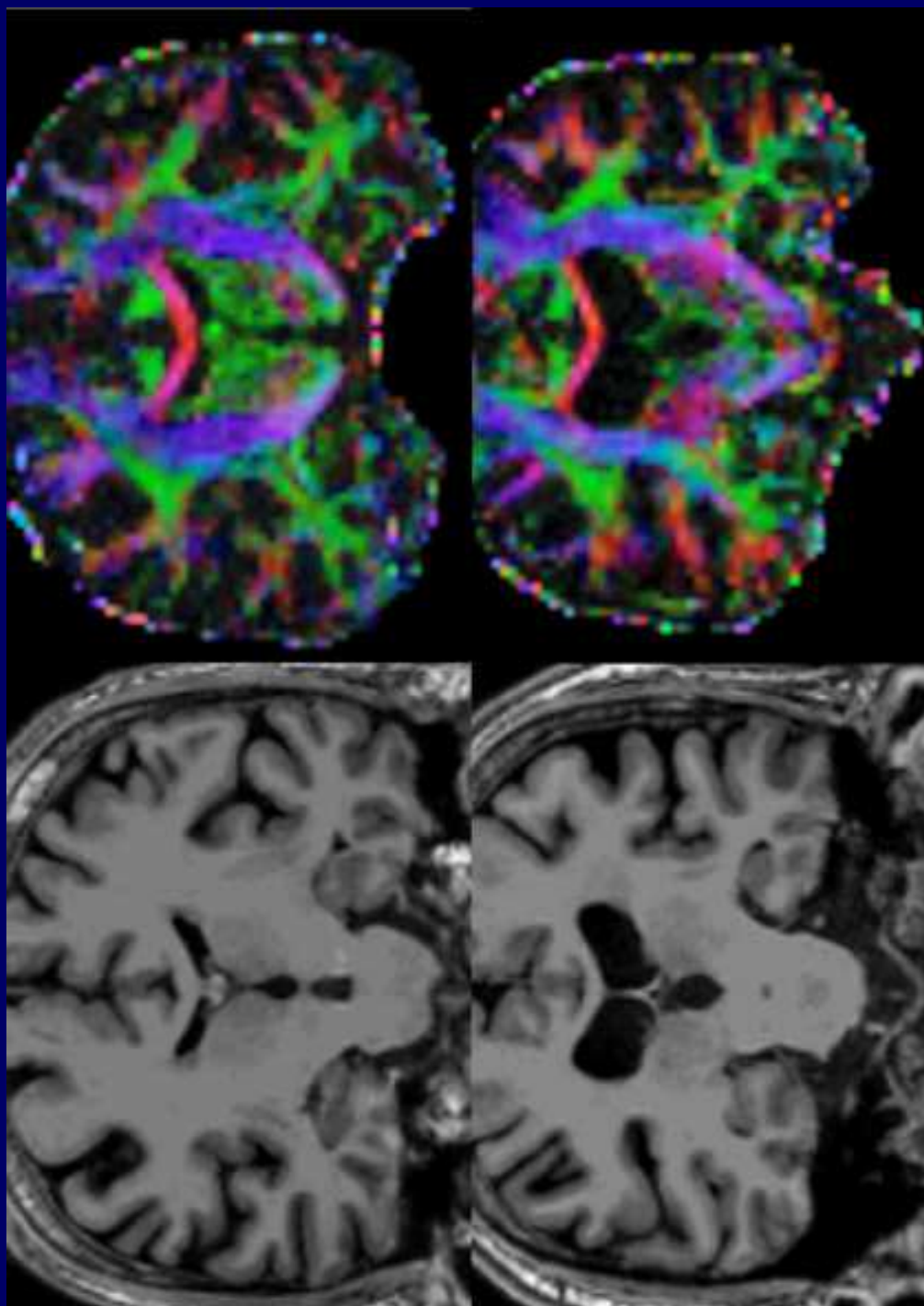


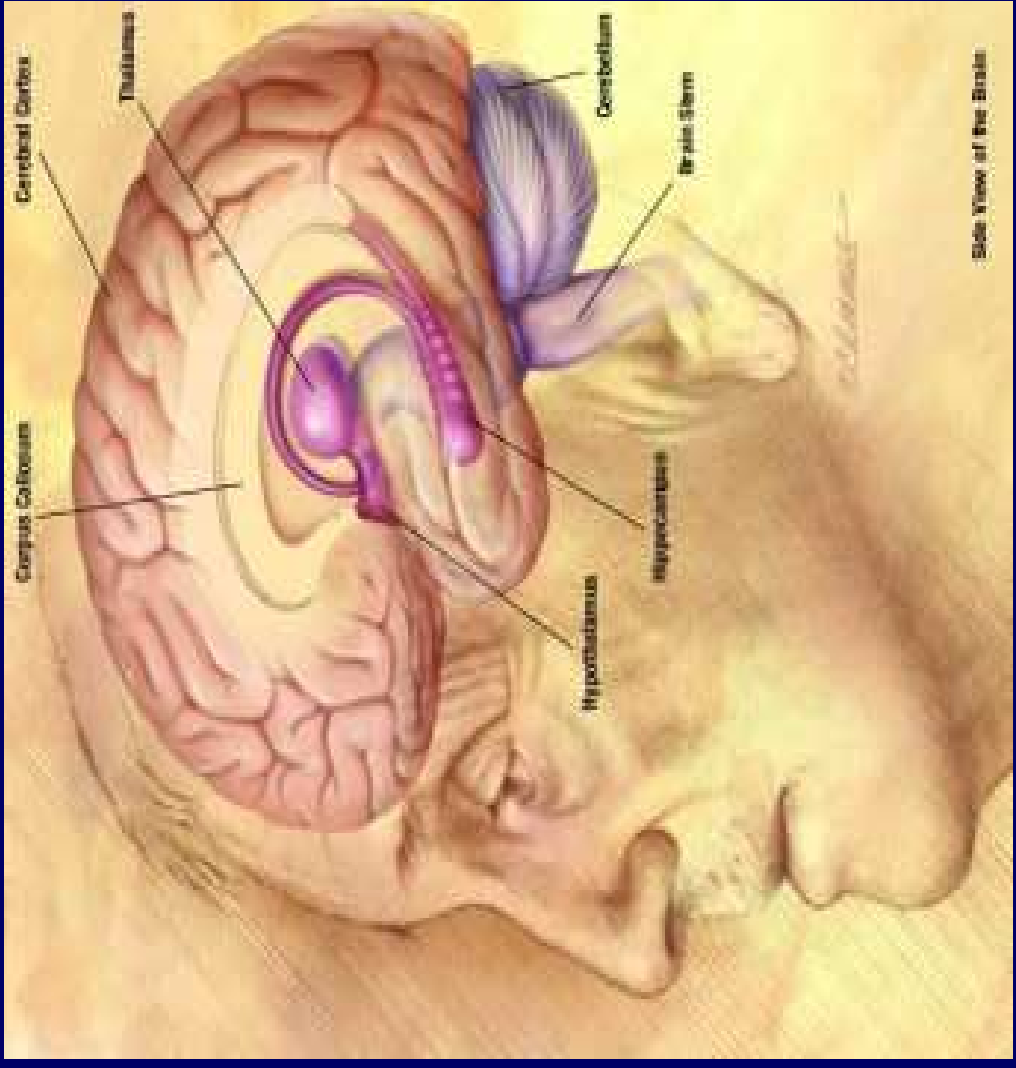
TUTTO HA INIZIO E FINE CON I NEURONI:  
DAI RECETTORI SENSORIALI AI NERVI CHE  
CONTROLLANO I MUSCOLI. OGNI COSA CHE  
PROVI, RICORDI O SOGNI È SCRITTA IN  
QUESTE CELLULE.





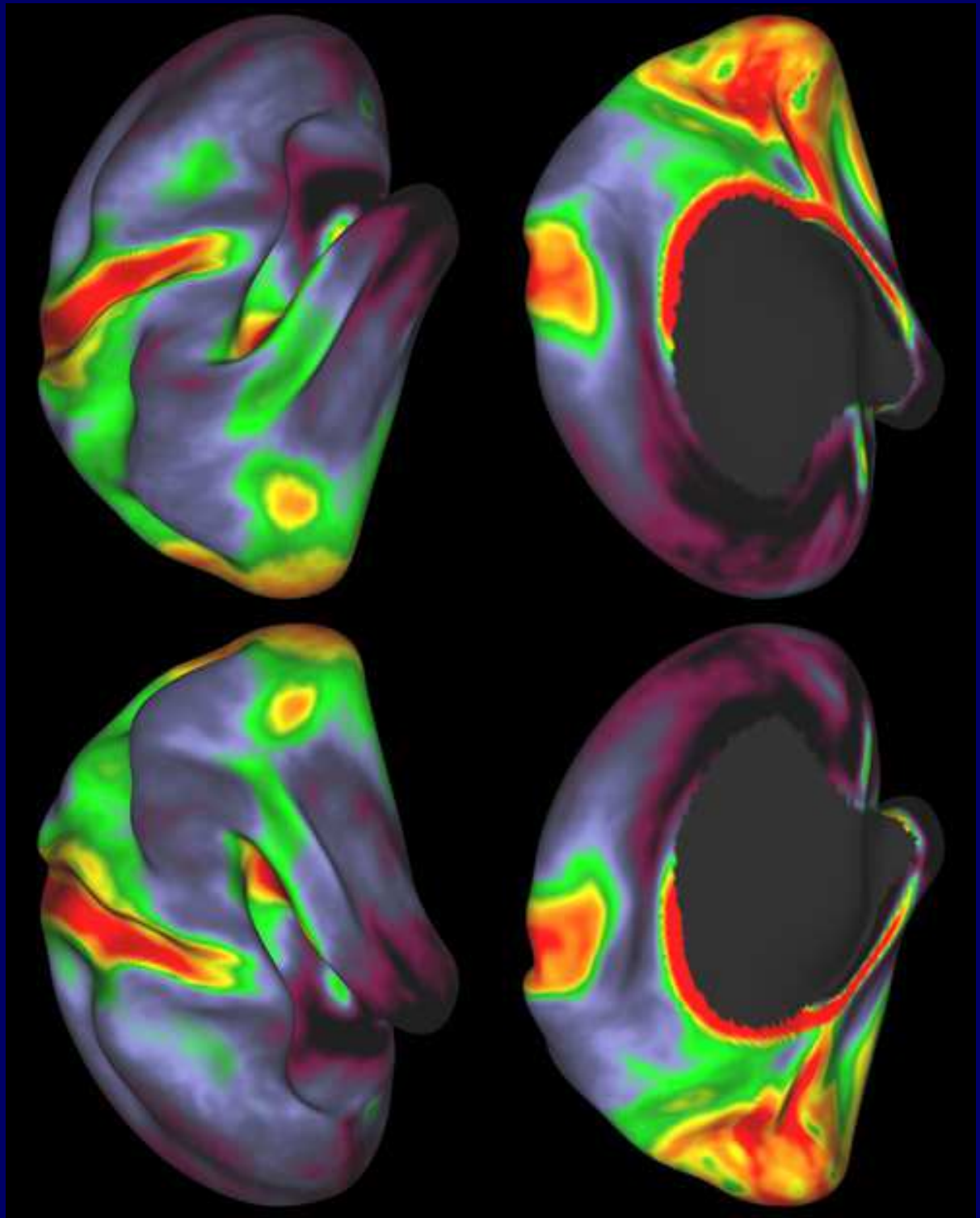






Side View of the Brain





**Neural Interface Technology**  
**for**  
**Rehabilitation:**  
**Exploiting and Promoting Neural**  
**Plasticity**



**Video Game Training  
enhances cognitive control  
in older adults**

**J. A. Anguera et al.  
NATURE 2013**



# **Serious Games For Serious Problems**

**SenseAble Technologies for Rehabilitation 3.0**



11

WILLIAM GIBSON

Neuromante

Traduzione di Bruce Sterling

Quinto libro



BOLLOMBO

# CyberTherapy

The Official Voice of iACToR

## & Rehabilitation

Issue 2 / 2013

### FEATURES:

Virtual Rehabilitation: Beyond Gaming

p. 10

fMRI as a Breakthrough to Studying Effects of Virtual Reality on Brain Activity

p. 21

### ASK THE EXPERT:

Vice-President of the European Commission  
Neelie Kroes

p. 31

### COUNTRY FOCUS:

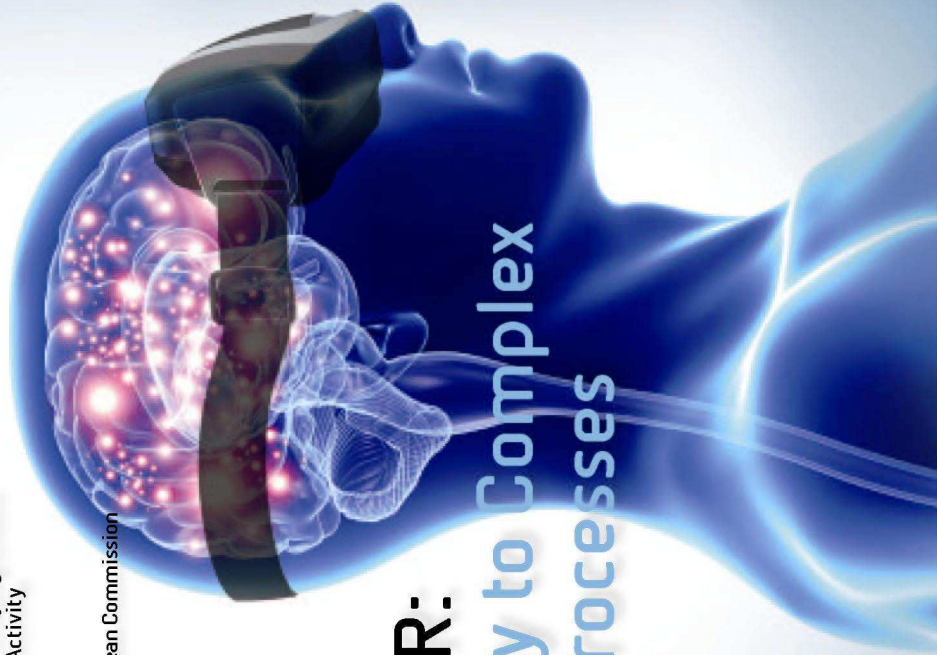
Greece

p. 40

### COVER STORY:

## fMRI-VR: Gateway to Complex Brain Processes

**and  
much  
more...**



# VISIONISM



**Exercise influences  
hippocampal plasticity by modulating  
BDNF processing**

**Ding Q, Ying Z, Gomez-Pinilla F  
Neuroscience 2011**



**Association between  
Level and Change  
in  
Physical Function and Brain Volumes**

**Aribisala BS et al  
PLoS ONE 2013**

**GIVE YOUR IDEAS SOME LEGS:**

**The positive effect**

**of**

**Walking**

**on**

**Creative Thinking**

**Oppezzo M, Schwartz DL**

**Journal of Experimental Psychology**

**April 2014**









**HEAD: obiettivo**  
**modello di riabilitazione**  
**a distanza**  
**sostenibile**

- dal punto di vista sanitario e sociale
- dal punto di vista tecnologico
- dal punto di vista operativo (ruoli, modelli, ...)









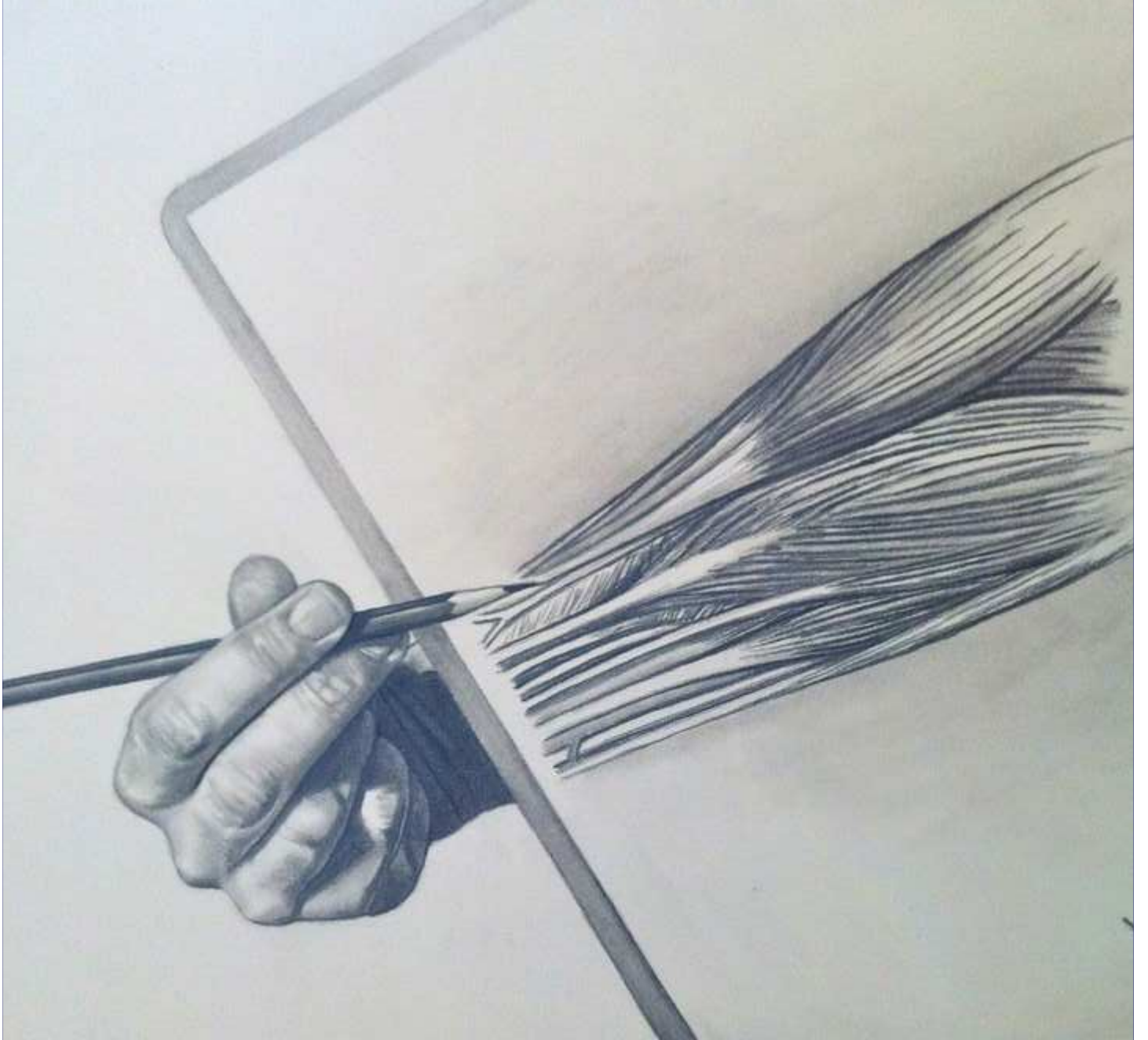






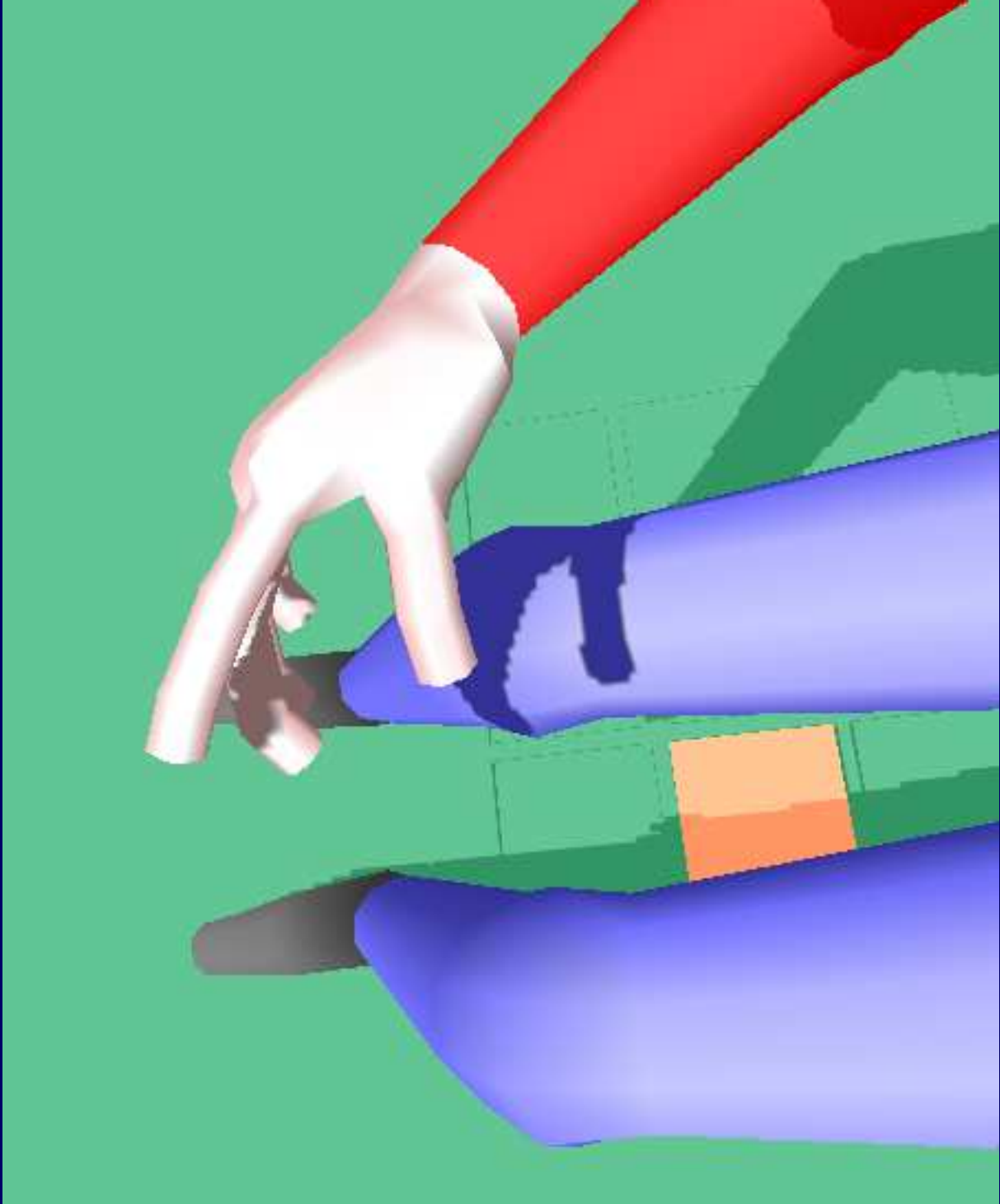
# **Body context and posture affect mental imagery of hands**

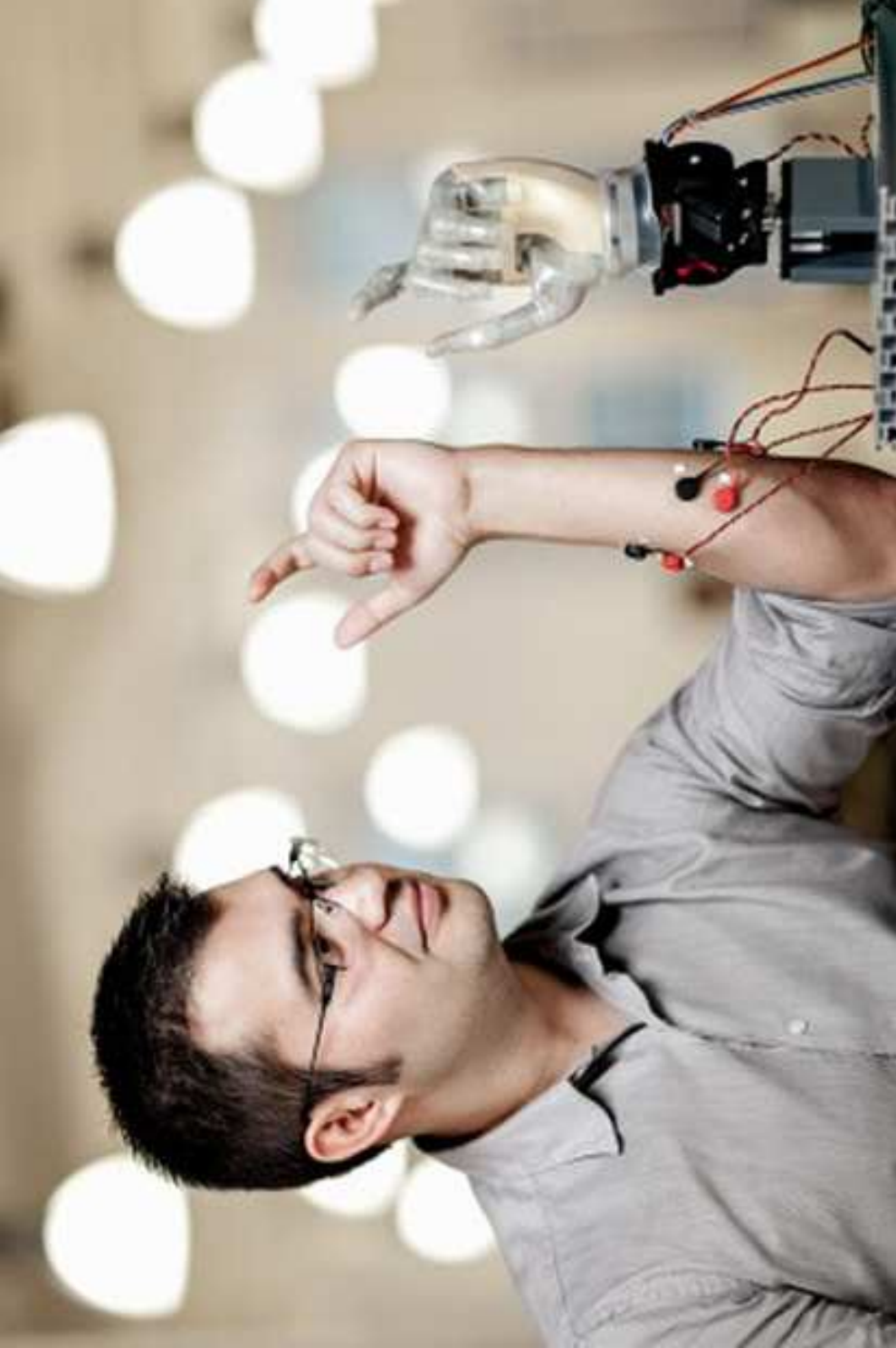
**Ionta S, Perruchoud D, Draganski B, Blanke O  
Plos One 2012**







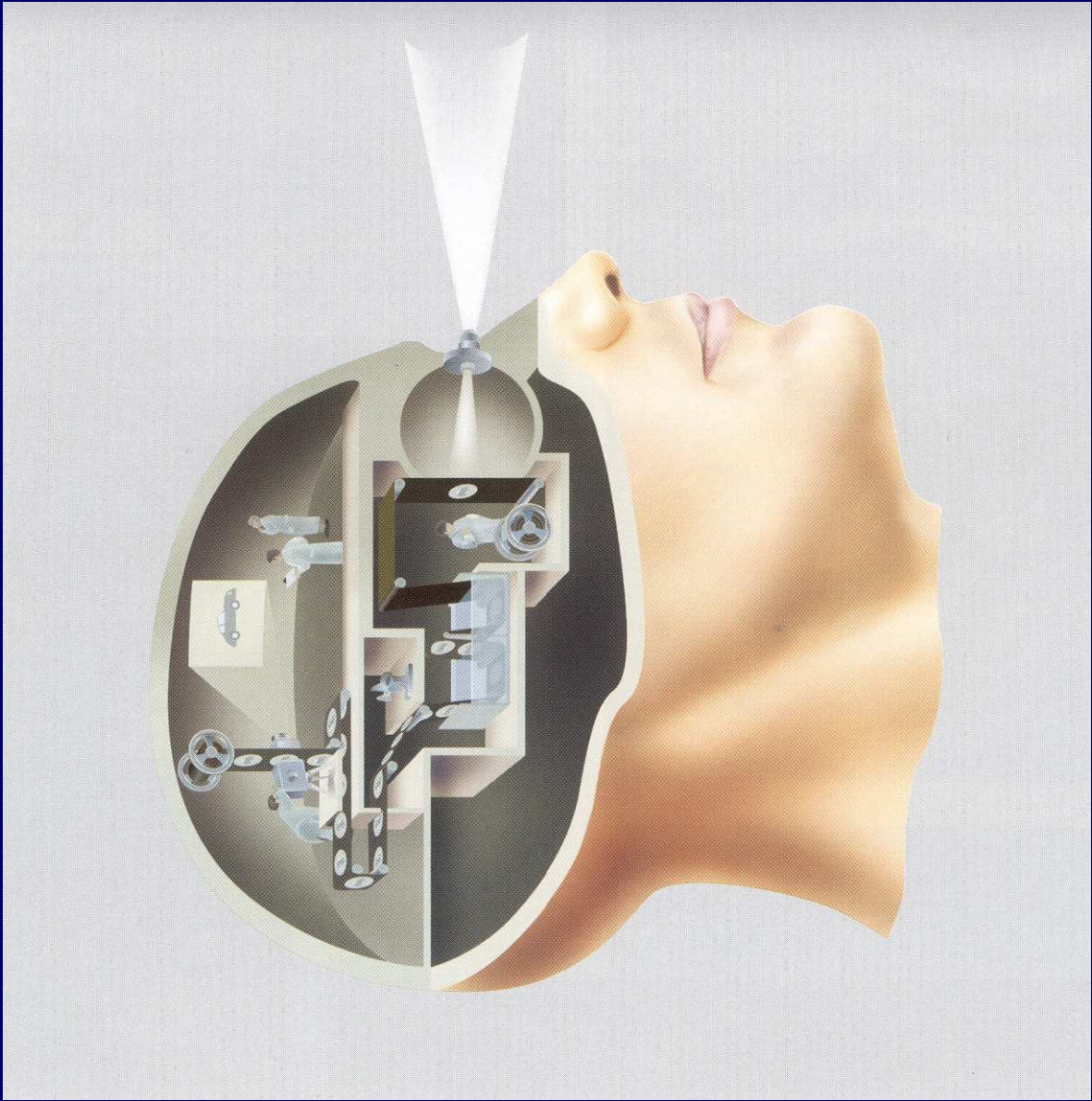








**Web based**





**Time**

**Timing**

**Distance**

**Place**

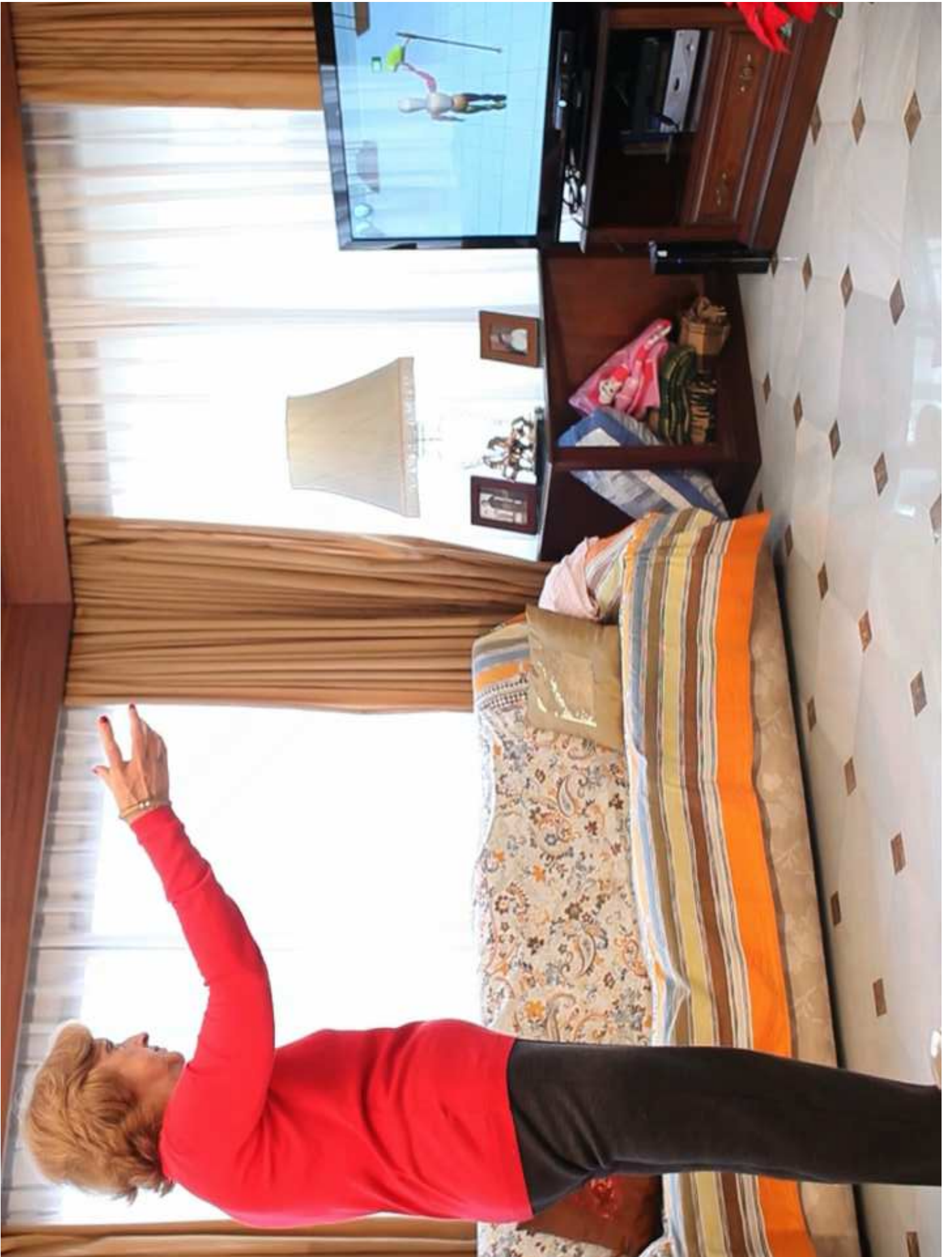


**www.????**

**Where**

**When**

**Why**





# HEAD: aspetti tecnologici

*tecnologie che permettano di*

**utilizzare**

*diverse modalità di stimolo:*

*visivo, motorio, sonoro,*

**misurare**

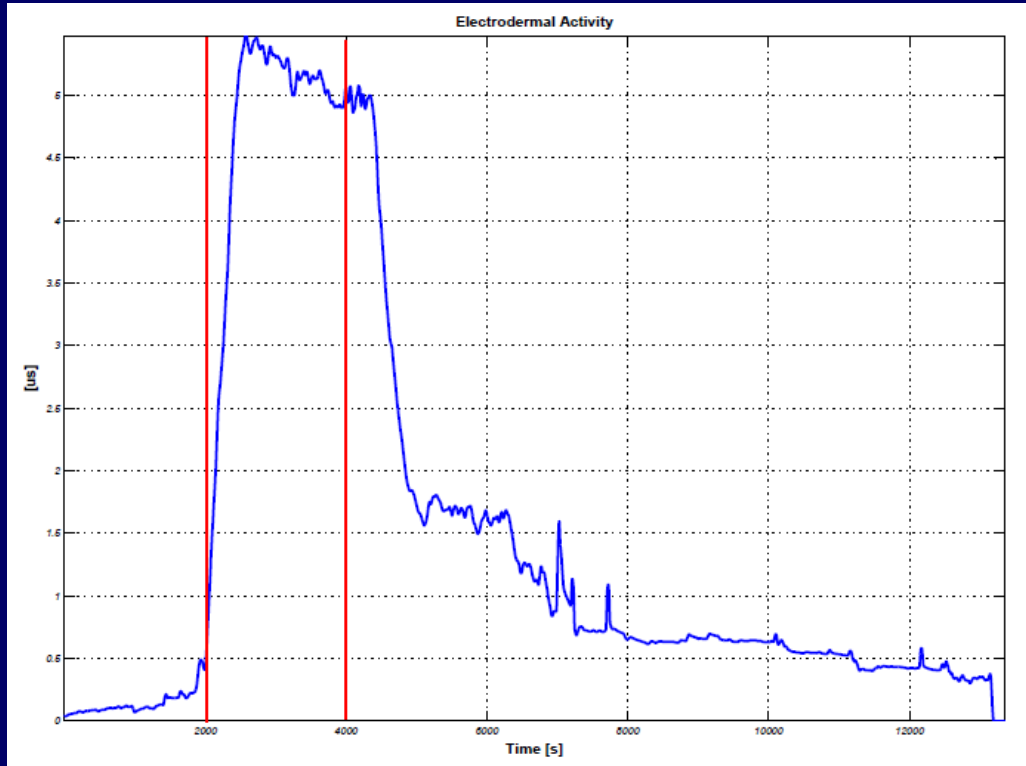
*l'intensità dell'esercizio proposto*

**Technology for Care**

**Technology for Services**

**Binaural Recordings**  
**Virtual 3D Surround Sound**

# Electrodermal Activity (EDA) & Behavior





# **Narrative Medicine**

**Health care and the illness experience  
are marked by uneasy and costly divides:  
between health care professional and patients  
and  
between and among healthcare professionals themselves**

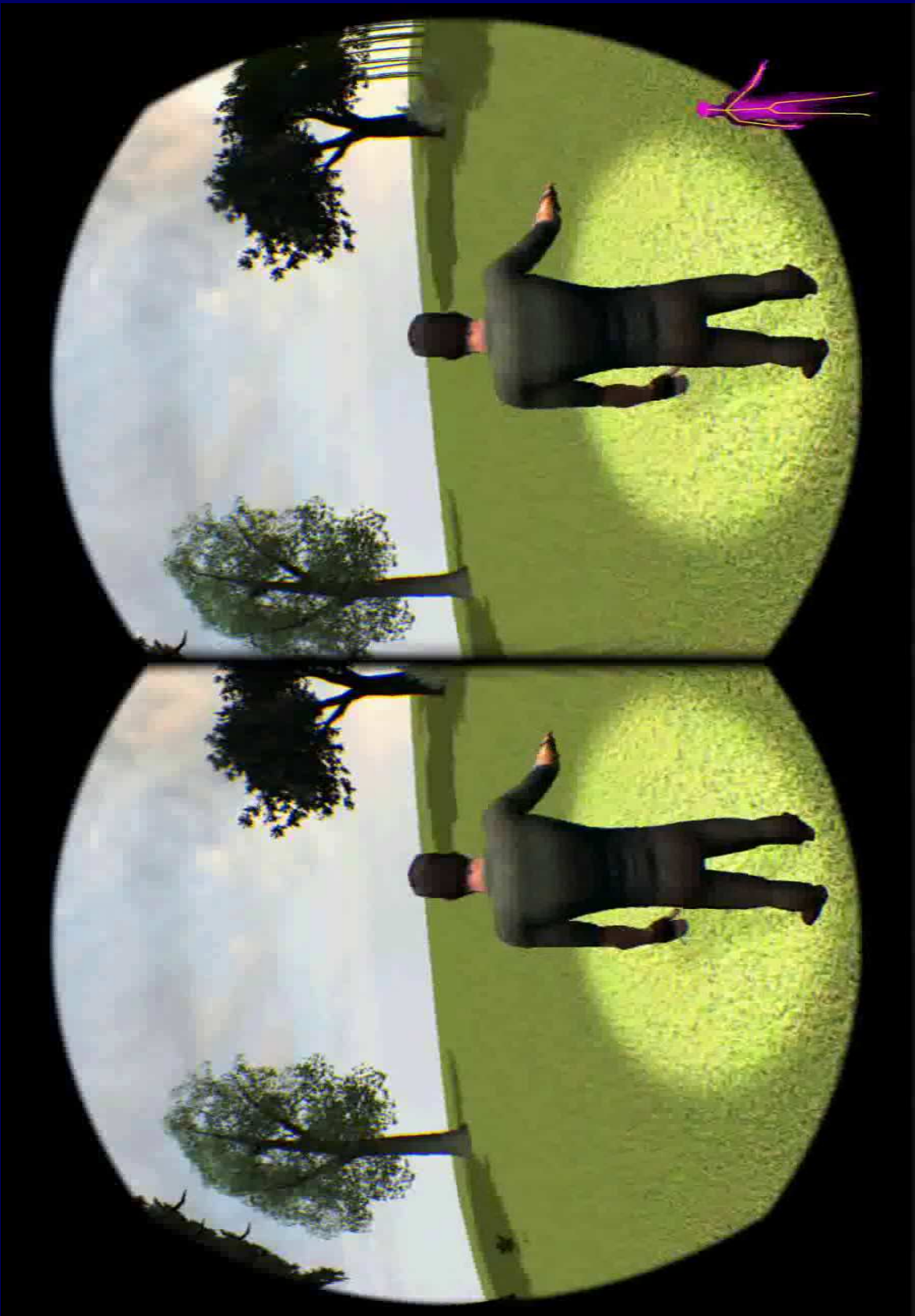
**Narrative Medicine is an interdisciplinary field  
that challenges those divisions  
and seek to bridge those divides**

**Neural Interface Technology**  
**for**  
**Rehabilitation:**  
**Exploiting and Promoting Neural**  
**Plasticity**



01:43:092





*di rilevare*

**l'impegno del soggetto durante  
l'esercizio**

*di rilevare*

**cambiamenti nello stile di vita  
del soggetto**



Reality Mining  
Data Mining

Reality Meaning  
Outcome Measures



# HEAD: aspetti operativi

## Ridefinizione dei ruoli

### Gestione

- delle informazioni
- dei flussi correlati
- dell'interazione Istituto/Domicilio
- dell'aspetto territoriale

**adeguamento del modello a differenti ambiti**

# HEAD: le fasi

**Fase 1:** **Scouting** delle tecnologie

**Fase 2:** definizione della **piattaforma tecnologica**  
di supporto

**Fase 3:** Definizione e strutturazione dei **percorsi di cura**

**Fase 4:** strutturazione della rete tecnologica in grado di erogare il  
**servizio al domicilio**

test operativo con utenti reali

**AMBIENTE**

- fisico
- Tecnologico
- socio-economico
- politico
- organizzativo

**Persona  
con  
disabilità**

**Caratteristiche/  
fattori personali**

- demografici
- biomedici
- Fattori di rischio

**BISOGNI**

**Famiglia e  
aiuti**

**Associazioni**

**Vita privata**

**Settore pubblico**

**Leggi**

**Scuola**

**Risorse**

**Lavoro**

**Casa**

**Cure**

**Servizi offerti**

- allocazione risorse,
- cure, educazione,
- accoglienza, alloggio,
- accompagnamento,
- lavoro, formazione,
- aiuti tecnici, trasporti..



**Risultato per la  
persona**

- Autonomia, Lavoro,
- Mobilità, Comunicazione,
- Vita personale, Relazioni  
sociali



**Risultato per la  
comunità**

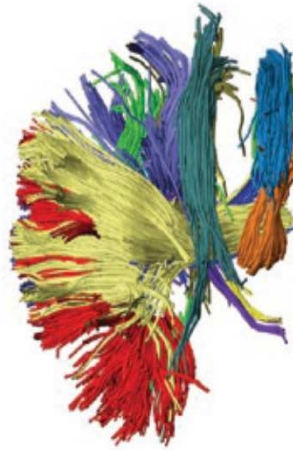
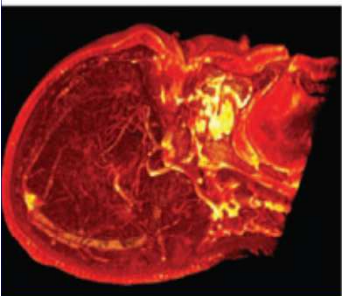
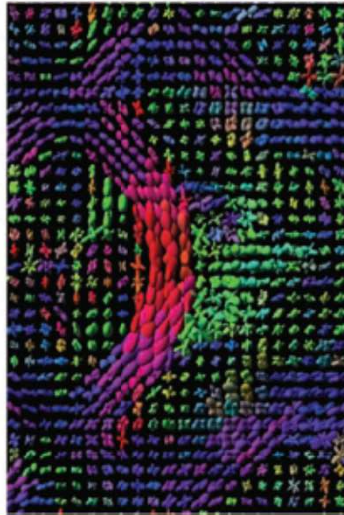
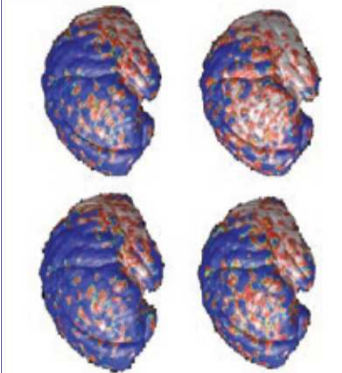
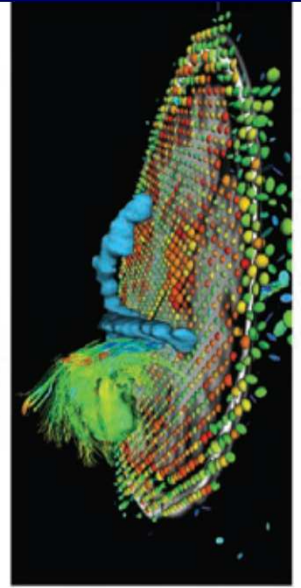
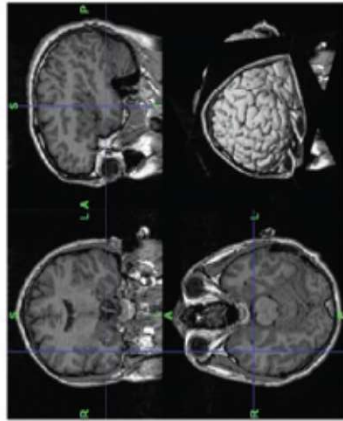
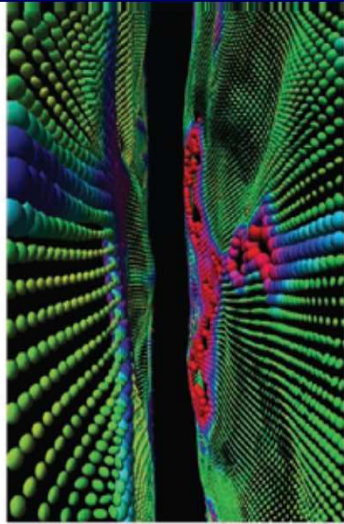
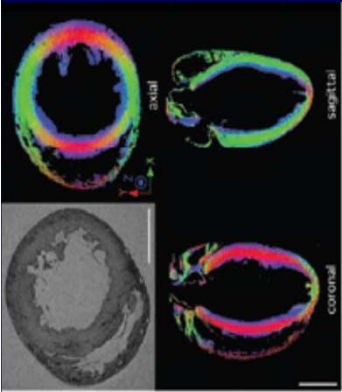
Coesione sociale

**Entrare nella vita  
del paziente  
standone fuori**

# **My body in the brain: a neurocognitive model of body ownership**

Tsakiris M

Neuropsychologia 2010



**Human SenseAble**

**Technologies**







# The Meaning of the Body

## Aesthetics of Human Understanding

*..what we call “mind” and what we call “body”  
are not two things, but rather aspects of one  
organic process.*

*Chief among those aesthetics dimensions are  
qualities, images, patterns of sensorimotor  
processes, and emotions*

**Mark Johson**

**The University of Chicago Press**

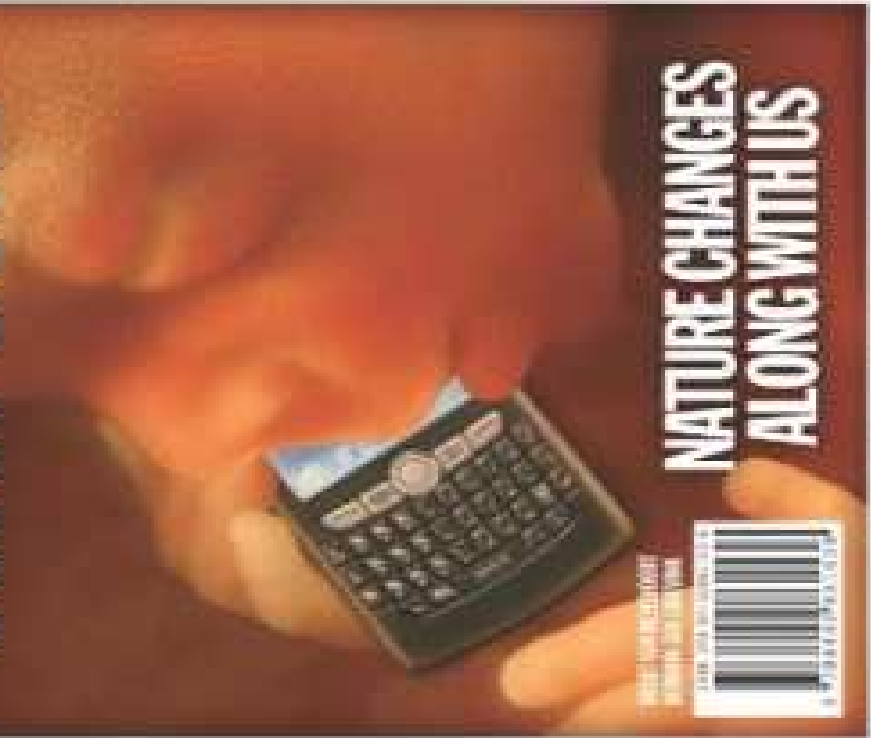
**2007**

Think of this as a window...

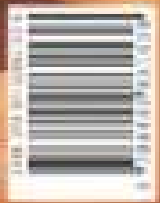
cinque

Altre prototipi per prototipi di...

# NEXT NATURE



PER INFORMAZIONI  
CHIAMATE IL NUMERO



NATURE CHANGES  
ALONG WITH US

Altre prototipi per prototipi di...

