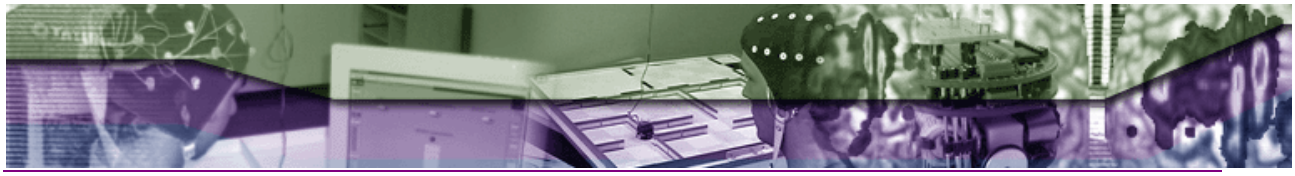


The MAIA Project

Non Invasive Brain Interaction with Robots
Mental Augmentation through Determination of Intended Action

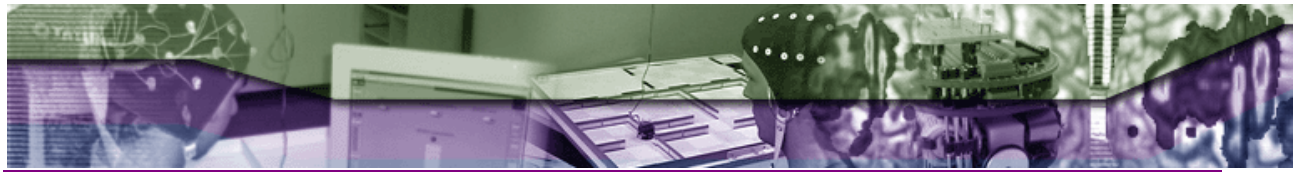
Workshop 2006
November 9-10, 2006

Challenging Brain Computer Interfaces:

Neural Engineering Meets Clinical Needs in Neurorehabilitation

Conference Center of Fondazione Santa Lucia IRCCS,

Via Ardeatina 354, Roma, Italy



Brain Computer Interfaces (BCIs) allow an individual to communicate with the surrounding environment, performing a direct translation of his/her brain activity into actions. Such a technology may allow, in perspective, partial recovery of their degree of autonomy to patients with severe motor disabilities.

Last years have witnessed advances in Brain-Computer Interfaces (BCI), but how far is this new field from clinical practice? The goal of the workshop is to draw the current and future scenarios involving the application of advanced neural engineering techniques to interpret brain signals for clinical use in the rehabilitation context.

The presentations will consist of a series of invited talks and poster presentations. Some of the major groups in BCI pursuing clinical applications of this technology will report their experience. The participation of the Associate Editors of relevant international journals in the field on neurotechnologies (IEEE TNSRE, Clinical Neurophysiology) will address how ultimate neural engineering techniques could meet the challenge. Also, the view of clinicians involved in neurorehabilitation programs will complete the picture. Finally, the European MAIA project will report their achievements in non-invasive brain-controlled robots.

José del R. Millán
Maria Grazia Marciani

Program

THURSDAY, Nov 9

Session One	*Chair:* Maria Grazia Marciani	
09:00 - 09:25		Welcome and Salutes
09:25 - 10:00	José del R Millán	Overview of the MAIA Project

Session Two	*Chair*: José del R. Millán	
10:00 - 10:45	Theresa M Vaughan	Brain-computer interface (BCI) research at Wadsworth: Taking the BCI home.

10:45 - 11:15 *Coffee Break*

Session Three	*Chairs*: Theresa Vaughan and Luigi Bianchi	
11:15 - 12:00	Andrea Kübler	Relation between physical impairment and BCI performance
12:00 - 12:25	Febo Cincotti	Haptic feedback in BCI context: Experimental setup
12:25 - 12:50	Tapio Palomäki	Haptic vs. Visual feedback for BCI

12:50 - 14:15 *Lunch*

Session Four	*Chairs*: Andrea Kübler and Febo Cincotti	
14:15 - 15:00	Christa Neuper	EEG-based brain-computer interfaces for restoration of movement
15:00 - 15:25	Ferran Galán	High-frequencies for EEG-based brain-computer interfaces
15:25 - 15:50	Pasi Jylänki	A Bayesian approach to select linearly separable spectral feature combinations

15:50 - 16:15 *Coffee Break*

Session Five	*Chairs*: Christa Neuper and José del R. Millán	
16:15 - 17:00	Jose M. Carmena	Emerging directions in brain-machine interfaces
17:00 - 17:35	Sara L. Gonzalez Andino	Non-invasive estimation of local field potentials

Poster Session	*Chairs*: Sara Gonzalez Andino and Fabio Babiloni	
17:35 - 18:00		Contributed Posters' Spotlight (1' each)
18:00 - 20:00		Poster Session

18:45 – 20:00 *Welcome cocktail*

FRIDAY, Nov 10

Session Six	*Chairs*: Florin Popescu and Donatella Mattia	
09:00 - 09:45	Shangkai Gao	Practical considerations of EEG-based brain-computer interface
09:45 - 10:30	Marco Molinari	High technology and neurorehabilitation: What patients and clinicians want vs what BCI and other frontier research provide.
10:30 - 11:00		*Coffee Break*
Session Seven	*Chairs*: Fabio Babiloni	
11:00 - 11:45	Marnix Nuttin	Intelligent robotics meets patients
Round Table	*Chair:* Marco Molinari	
11:45 - 12:30	M Bozzetti, A Kübler, D Mattia, J del R Millán, C Neuper,TM Vaughan	*Round Table:* Clinical Aspects of BCI
12:30 - 14:00		*Lunch*
Session Eight	*Chairs*: Shangkai Gao and Marnix Nuttin	
14:00 - 14:45	Florin Popescu	Functional rehabilitation applications of BCI: Cost, performance and patient needs.
14:45 - 15:10	Pierre W Ferrez	Error-related potentials for brain-computer interfaces
15:10 - 15:45	Gerolf Vanacker	Adaptive shared control for brain-computer interfaces
15:45 - 16:00	José del R. Millán	Closing Remarks