



## The 2012 Winter Hand Workshop

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# Consortium Meeting

## IIT ADVR, Genoa, January 12-13, 2012

### Agenda

#### January 12, 2012

10:30:00	Welcome and Introduction
10:40	THE WP1: <b>Lund</b> , SICS, Pisa, Utrecht, Siena
11:20	THE WP2: <b>Utrecht</b> , Bielefeld, Paris, Pisa, DLR
12:00	THE WP3: <b>Siena</b> , Pisa, DLR, Athens
12:40	Lunch
14:00	THE WP4: <b>Bielefeld</b> , Paris, Athens, Pisa, Utrecht
14:40	THE WP5: <b>Athens</b> , DLR, Pisa, Siena, Utrecht
15:20	HANDS.DVI Project Introduction
16:00	HANDS.DVI Partner Description: <b>IIT-ADVR</b>
16:40	Coffee Break
17:10	THE WP6: <b>DLR</b> , Pisa, Siena
17:50	IIT Lab Visit
19:20	Discussion and Dinner

#### January 13, 2012

09:00	THE WP7: <b>Paris</b> , Pisa, Siena, Utrecht
09:40	ERC <b>PATCH</b> Project Introduction (UPMC)
10:20	THE WP8: <b>DLR</b> , Athens, Pisa, Siena, Lund, SICS
11:00	THE WP9: <b>Pisa</b> , DLR, Siena, Paris, Bielefeld, Athens, Lund, SICS
11:20	SOFTHANDS Project Introduction
11:40	Coffee Break
12:10	THE Management, Dissemination, Exploitation: <b>Pisa</b>
12:20	Discussion Agenda
12:50	Lunch
15:00	Discussion + Guest Talks

## Discussion Topics (Preliminary)

- 1) Answers to Comments
- 2) Common Definition of Synergies
- 3) Creation/Sharing of Datasets

## Partner Responses to Reviewer Comments

To be prepared before the meeting

### Work to be done @M24

#### 1) Ethical management Report

The members of the Board for the Management of Ethical Issues (BMEI), Romano Danesi - Università di Pisa, Italy, Germund Hesslow - Lund University, Sweden and Jason Robert - Arizona State University, USA deliver a second report by the end of February.

#### 2) Deliverables @ Month 24

##### UU

D2.1 *Report on saliency of features* - WP2

##### UNIFI

D2.2 *Report on digit positioning task* - WP2

D5.1 *Autonomous grasping control methodology using synergy primitives* - WP5

D9.2 *Theoretical framework for THE hand embodied*- WP9

##### DLR

D3.1 *Report on the hand and grasping models* - WP3

D6.1 *Evaluation of the synergistic concepts on the DLR antagonistic hand* - WP6

D8.1 *EMG-based finger force and movement control*- WP8

##### UNIBI

D4.1 *Report on the role of prior knowledge* - WP4

D4.2 *Report on human manipulation learning* - WP4

#### 3) Milestones @ Month 24

##### UNISI

M1.1.2 *Investigation of specific patterns of cue processing*

Means of verification: Description of the patterns of cortical areas that are necessary in order to use the specific critical haptic cues in identifying a virtual or a real object

#### **M3.4.1 Characterize feasible manipulation and grasping requirements for given artificial design**

Means of verification: Tools will be provided to characterize which are the feasible manipulation and grasping requirements for a given artificial design, or to design the simplest device that can achieve a given set of tasks. A systematic tool to evaluate the kinematic and dynamic model of the hyper-realistic DLR hand simulating natural or artificially imposed synergies will be proposed.

### **ULUND**

#### **M1.2.2 Characterization of processing of synaptic inputs of whole cells**

Means of verification: Synaptic integration process and the distribution of synaptic weights of primary afferent inputs in cuneate neurons described

#### **M1.4.2 Effects of activation of peripheral inputs on the synaptic integration**

Means of verification: Description of how peripheral feedback can influence and reshape the descending motor command through the spinal premotor neurons)

### **SICS**

#### **M1.5.0 Model of microcircuitry-based synergy control in the brain**

Means of verification: Preliminary mathematical description of synergies based on connectivity and other low-level neuronal properties developed and documented

#### **M8.2.1 Application of techniques for haptic feedback of robot arm data**

Means of verification: Techniques applied, experiments finished, results communicated

### **UU**

#### **M2.1.2 Quantitative model of feature saliency in search and discrimination tasks**

Means of verification: Model proposed and communicated. Extensive experiments on feature saliency (both single cue and multiple cue) have been performed with human participants. Based on the data collected, a model describing tactual saliency will be proposed. Both data and model will be of use for subsequent tasks.

### **NTUA**

#### **M3.2.2 Experiments on synergies in different grasping tasks**

Means of verification: The experimental tests in M3.2.1 will be performed. Different approaches will be used to analyze data, not limited to principal component analysis, and including other techniques introduced to take into account the switching grasp primitives.

### **UNIPI**

#### **M3.3.2 Revision of Geometric Model of Synergies in Grasping**

Means of verification: The geometric model of synergies in grasping will be revised and validated with the experimental test results. The simplification introduced by the synergy approach could lead to approximated results in the kinematic and dynamic representation of the hand. The level of approximation will be evaluated and the minimum number of synergies necessary to represent the grasping with a sufficient reliability will be defined.

#### **M9.2.2 Collection and integration of technical material**

Means of verification: Material for technical Integration collected from theoretical WPs (3 and 5) and technological WPs (6,7,8). Matching illustrated and documented. Interfaces described, instantiations listed. Experimental apparati described, usage notes shared.

**M10.2.1 Reach for general audience including non-technical industry management**

Means of verification: List of press releases, press coverage, trade fairs attended.

**UNIBI****M4.3.1 Preliminary model of synergy-based skill learning**

Means of verification: Model to control a robotic arm that is based on human grasping data and models of human behaviour should be created. This model will have to be made available for the robotic implementation.