

A hand is pointing towards a robotic gripper that is holding a small, dark object. The gripper is part of a robotic arm with various sensors and components. The background is a light blue gradient.

# ECHORD Experiments kick-off meeting

- second and third amendment-

6.4.2011

Västerås, Sweden

European Clearing House  
for Open Robotics Development  
[www.echord.info](http://www.echord.info)



# Agenda

- Welcome note
- Current state and timeline for Call 2 and Call 3 experiments
- ECHORD's concept to handle experiments
- Introduction of participants and experiments
- Experiment monitoring – procedures and requirements
- Experiment monitoring – IT infrastructure
- Open discussion about networking opportunities within ECHORD

# The ECHORD Project: Brief History and Motivation

## Idea

- Encourage robot manufacturers and research institutions to work together more closely on an operational level
  - **Instrument 1:** Enable them to get funding for small projects (called “**experiments**” in the sequel)
  - **Instrument 2:** Start a **systematic bidirectional exchange** of views and opinions about the trends, needs and technology developments
- ▶ **Shape European robotics future profile ... by strengthening two-way synergies between academia and industry!**

# Calls for experiment proposals – timing and statistics

Call	Call open	Deadline	Evaluation results sent	Number of eligible proposals	Number of resubmissions as marked by proposers (*)	Number of experiments selected
1	Oct 5, 2009	Dec 1, 2009	Mar 15, 2010	108	n/a	16
2	Mar 16, 2010	Apr 30, 2010	July 27, 2010	70	16	20
3	Aug 24, 2010	Oct 1, 2010	Dec 23, 2010	65	18	15
	<b>TOTAL</b>			<b>243</b>	<b>34</b>	<b>51</b>

(\*) The total number of resubmissions includes also double resubmissions in call 2 & 3

## Overall timeline

- Due to delayed start of experiments of call 1, experiments of calls 2 and 3 will not be completed during the 42 month total duration of ECHORD
- Amendment request 2 (experiments of call 2 + remaining experiments of call 1) includes a request for extension of the Project to 50 months (Feb. 2013)
- Additional time for scientific follow-up after completion of experiments

# Management issues

- All experiments (and coordinating parties) form **one single project** (= ECHORD)
- All actions/paperwork of the experiments must be in compliance with FP7 rules
- Handling of financial issues according to the institution's usual practice
- Official ECHORD reporting periods as in the amendment request: End of 2010, End of 2011, Feb. 2013 (end of project after accepted extension)

# Amendment stages



Selection of proposals for funding



Information to experimenters

Info letter I & II



Check budgets

Exchange with EC



Enter data into NEF

Draft GPF and DoW



Check and update NEF

Signed amendment

# QM for experiments – Monitoring and Reviewing



# Timeline experiments

When	What
ASAP	Start of the experiments
M1	Phone conference regarding experiment start
M4, 6, ...	On-line progress reports and website contents
M6...9	Visit by ECHORD staff or reviewers (selected experiments)
M9	Mid-term review
M15	Multimedia report
M18 (end of exp.)	Final report and final review
May 2012	Presentation of selected experiments at AUTOMATICA

# Reporting and Reviewing

- Emphasis on **tangible** results, pictures, videos, live demonstrations
- Bi-monthly online reports
- Short deliverables (1 or 2 pages + multimedia material)
- Mid-term and final review for experiments (internally)
- Possibilities for reviews:
  - Remote (paper, multi-media)
  - On-site at experimenter's location
  - Central location for all experiments
- These experiment reviews are regarded as preparatory reviews for the official EC reviews of the whole ECHORD project

# Demonstration and dissemination of results

## Emphasis on **tangible results**

- Demonstrators (live at events, multimedia material on the web)
- Website and social media
- Papers at conferences and workshops
- Organisation of special tracks and workshops at major conferences

# Introduction of participants and experiments

Participant	Institution/company	Experiment name	
Jorge Martins	UT Lisboa	HIPROB (Call 3)	1
Paulo Gonçalves	UT Lisboa	HIPROB (Call 3)	1
Rich Walker	Shadow	HYFLAM (Call 2), DEXDEB (Call 2)	1
Hugo Elias	Shadow	DEXDEB (Call 2)	1
Jake Goldsmith	Shadow	HYFLAM (Call 2)	1
Markus Schwarz	Universitätsklinikum Mannheim	AssRob (Call 3)	1
Craig A. Lindley	Blekinge Institute of Technology		1
Iñaki Maurtua	Tekinker	EASYPRO (Call 2)	1
Volker Krueger	Aalborg University	GISA (Call2)	1
Ole Madsen	Aalborg University	GISA (Call2)	1
Cédric Baradat	Tecnalia	Prada (Call 3)	1
Norbert Elkmann	IFF		1
Christoph Walter	IFF		1

# Introduction of participants and experiments

Participant	Institution/company	Experiment name	
Per Ljunggren	Intelligent Machines Stockhol AB	MUCE (Call 3)	1
Cristian Secchi	University of Modena, DISMI	TRAFCON (Call 1)	1
Luca Bascetta	POLIMI	FIDELIO (Call2)	1
Paolo Fiorini	Università di Verona	EduFill (Call 3)	1
Gabriele Randelli	Università di Roma	S4R (Call 3)	1
Luis Unzueta	Vicomtech	KOMPEYE (Call 3)	1
Daniel Vander Vorst	Vicomtech	KOMPEYE (Call 3)	1
Rodolphe Gelin	Aldebaran	BABIR (Call 2), GRASPY (Call 1)	1
Dirk Kraft	University of Southern Denmark	LearnBiP (Call 2)	1
Carlos Perez Vidal	Universidad Miguehl Hernandez Elche	MAAT (Call 2), HERMES (Call 3)	1
Sebastian Haag	Fraunhofer IPT		1

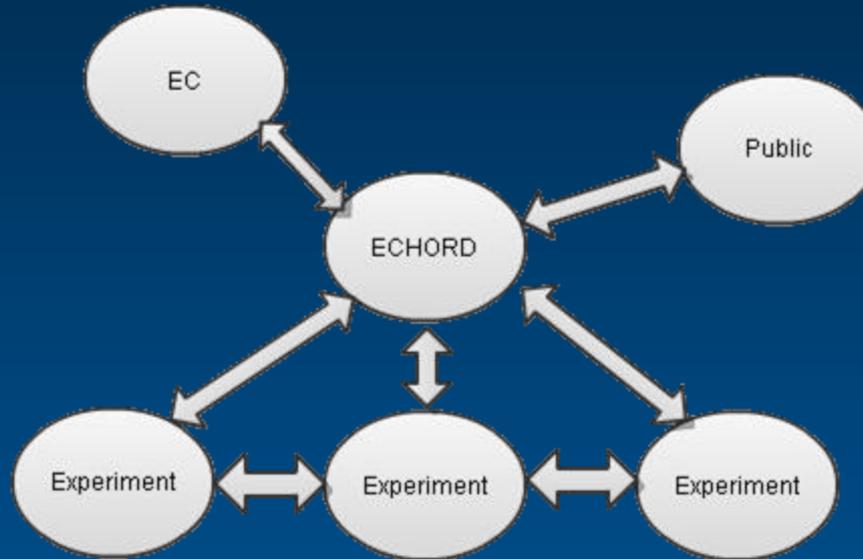
# Introduction of participants and experiments

Participant	Institution/company	Experiment name	
Wael Suleiman	Universtität Heidelberg	GOP (Call 2)	1
Pedro Santana	UNINOVA	RIVERWATCH (Call 3)	1
José Barata	UNINOVA	RIVERWATCH (Call 3)	1
Matthias Kennel	Fraunhofer IFF	BRACOG (Call 2)	1
Diego Barrettino	SUPSI	REMAV (Call 3)	1
Domenica Prattichizzo	University of Siena	HANDS (Call1)	1
Björn Kahl	Univ. Applied Science Bonn-Rhein-Sieg	EduFill (Call3)	1
Klas Milsson	Lund Univ.	MONROE (Call2)	1
	TU Berlin	RODIN (Call 3)	1

# Monitoring of Experiments

# Communication within the project

- Communication structure

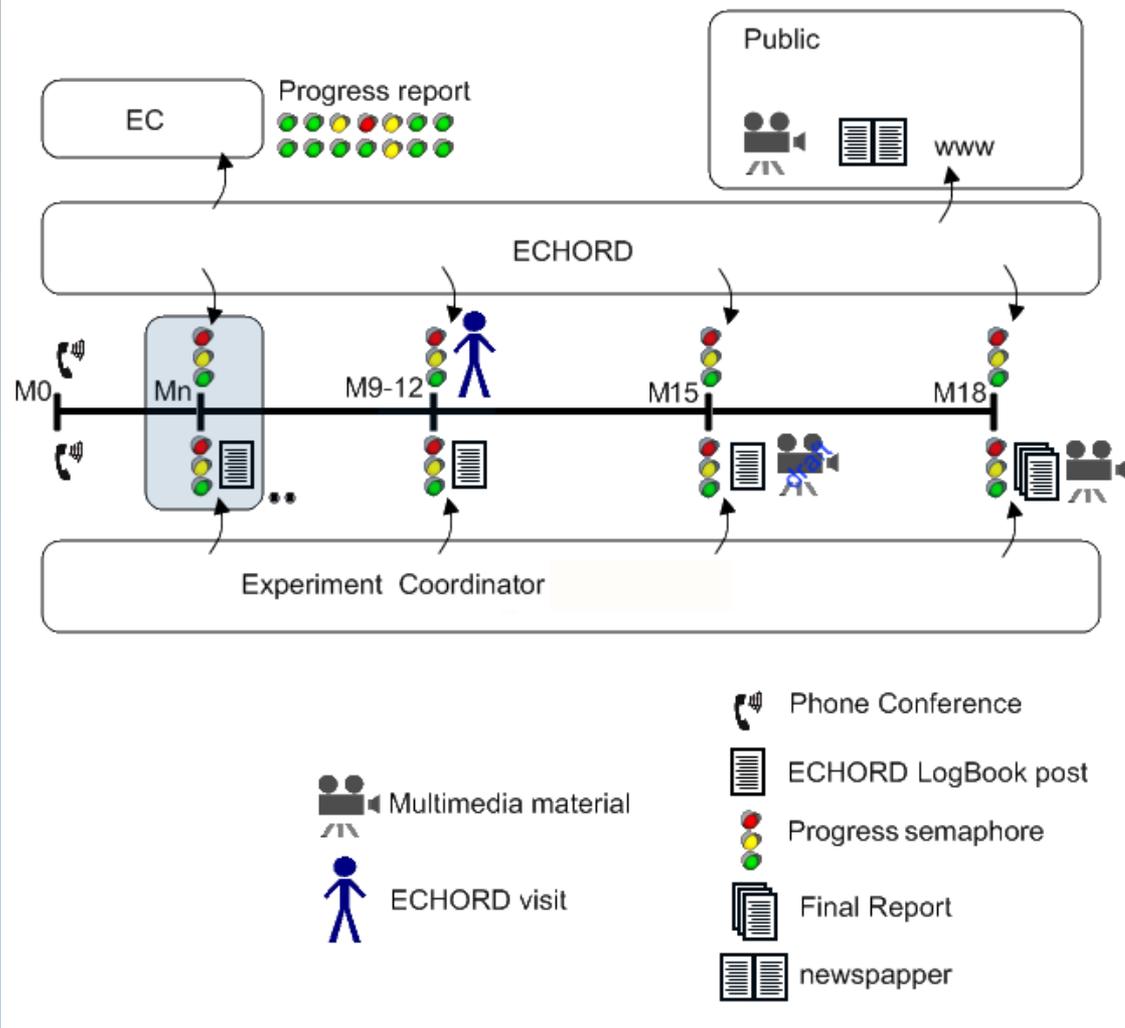


# Scientific monitoring

Four communication tools will be used:

- On site visits (ECHORD $\leftrightarrow$ Experimenters).
- The IT platform (blog +wiki) (Exp. $\leftrightarrow$ **ECHORD** $\leftrightarrow$ EC $\leftrightarrow$ Public)
- Progress report table (Experimenters $\rightarrow$ ECHORD $\rightarrow$ EC)
- Phone/video conferences (**ECHORD** $\leftrightarrow$ Experimenters)

# Scientific monitoring

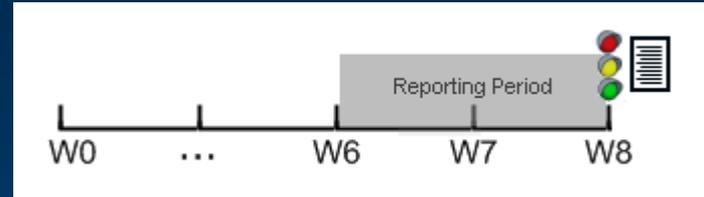


# Scientific monitoring

- Kick-off Phone conference
  - acknowledge the start of the experiment
  - clarify the monitoring rules and introducing monitoring
- ECHORD-Logbook: bi-monthly logbook post
- One monitoring visit for selected experiments
  - between month 6 and month 9 (agreed with research team)
- Phone/video conference.
- Multimedia reports on month 15 (draft )and month 18 (final report);
- Experiment Wiki
- Traffic light status tables.

# LogBook reporting timeline.

- Reports must be made every two months



- Reporting timeline:

1. ECHORD report and traffic light  
(discussed with the experiment moderator)
2. Summary
3. Public summary

# ECHORD report.

**Size:** up to 7500 characters with spaces.

**Visibility:** Experimenter+ Core Consortium

**Comments.** Available (Blog discussion with the moderator)

**Objective:** Monitoring.

**Description:** Describes the experiment efforts in detail:

- techniques and equipments used
- obtained results
- interesting remarks
- clear indication about deviations (traffic light).

# ECHORD report – traffic light

## Examples

	<p><b>Justification:</b> The project is progressing as planned without significant deviations. Milestones and deliverables are scheduled and not at risk.</p>
	<p><b>Justification:</b> The project is progressing as planned with small deviations. Milestones and deliverables are scheduled and not at risk., although small delays are possible. The main problems we had to address were... We expect the following delays...</p>
	<p><b>Justification:</b> The project isn't progressing as planned and significant deviations are to be considered. Milestones and deliverables are at risk. The main problems we had to address were... The plan designed to solve this issues is... We expect the following delays...</p>

# Summary.

**Size:** 1000 characters with spaces.

**Visibility:** **ECHORD** consortium.

**Comments.** Available

**Objective:** Cross experiment technology transfer and final reporting.

## **Description:**

- abstract focusing on the main items reported in the post;
- should be written in an incremental way;
- stack of Summaries as the base for the final and annual reporting;

# Public summary.

**Size:** 500 characters with spaces

**Objectives:** Public awareness of the project.

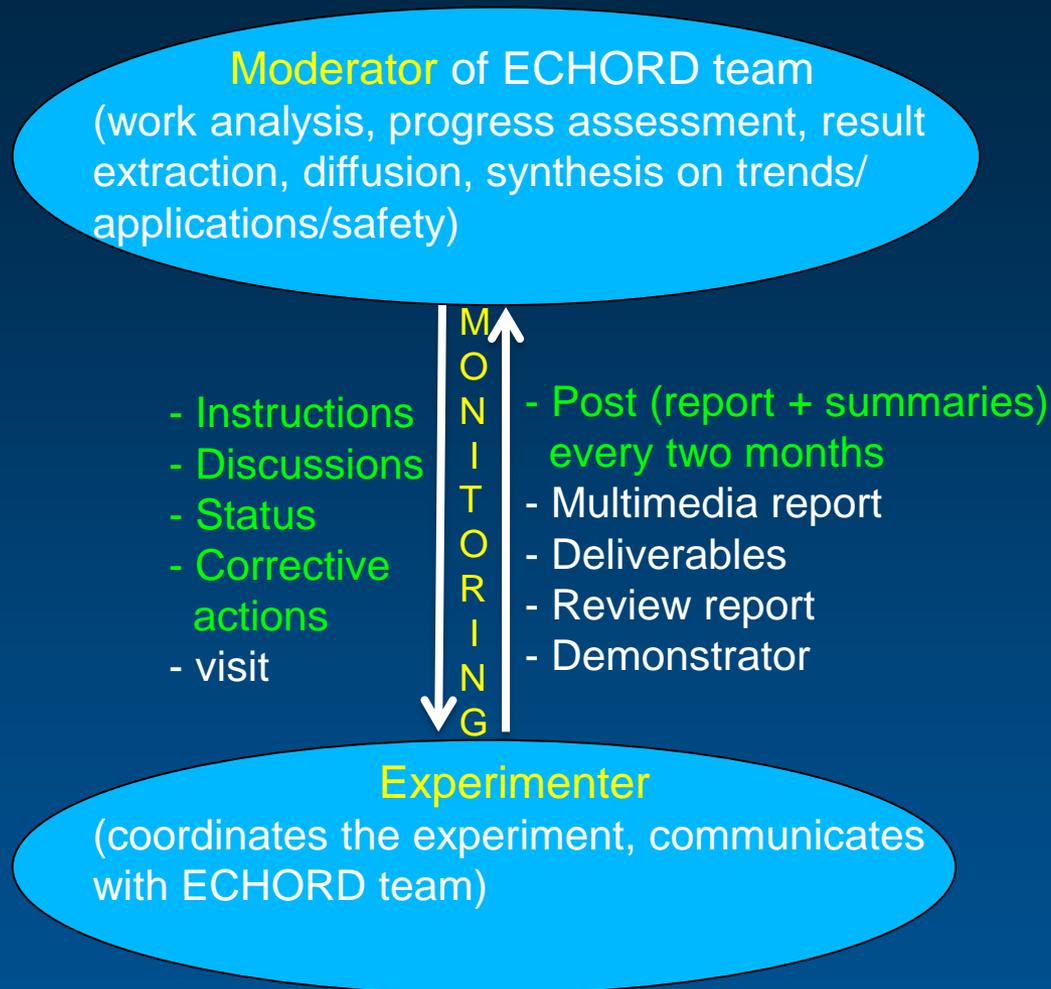
**Comments:** not available.

## **Description:**

- public information that will be printed on the **ECHORD** website.
  - easy to read and attractive
  - directly printed in the Experiment wikipage.
- Each experiment team has the responsibility of maintain a wikipage which is the public face of the project.

# IT platform for monitoring

# IT-Platform: monitoring, communication with experimenters



# IT-Platform: a tool used in the monitoring to optimize the structured dialogue with and inside ECHORD experiments

Frequent, fast, efficient, interactive and evolutive **communication** is required between many Moderators, Experimenters and Public



**IT-platform** on the ECHORD website using wiki-pages offers these advantages

# IT-Platform: main page of the ECHORD website

The screenshot shows the main page of the ECHORD website. The browser window title is "ECHORD : Home - Mozilla Firefox" and the address bar shows "http://www.echord.info/wikis/home-wiki/home". The page features a blue header with the ECHORD logo and the text "European Clearing House for Open Robotics Development". Below the header is a navigation menu with links for "Partners", "About", "Press", "FAQ", "Calls", and "Events", along with a search box. The main content area includes a breadcrumb trail "» Wikis » Home Wiki", a "Last editor" notice for "Anna Marcos Nickol" dated "Mar 29", and a "Browse this Wiki" link. The "Home" section has "Tags: no tags assigned" and a "The Project" section describing the ECHORD project as an EU-funded initiative for strengthening cooperation between scientific research and industry in robotics. A logo for the "EU Robotics Forum" is visible in the bottom right corner of the content area.

# IT-Platform: access

ECHORD: Home - Mozilla Firefox  
http://www.echord.info/wikis/home-wiki/home

Hello, [User] Log out

[Wikis](#) [Files](#) [Groups](#) [Deleted](#)

[Home Wiki](#)  
[InterAID](#)  
[Monitoring](#)

**ECHORD** European Clearing House for Open Robotics Development

[Partners](#) [About](#) [Press](#) [FAQ](#) [Calls](#) [Events](#) Search

» Wikis » Home Wiki Last editor: Anna Marcos Nickol, Mar 29

View Details Browse this Wiki

## Home

**Tags:** no tags assigned

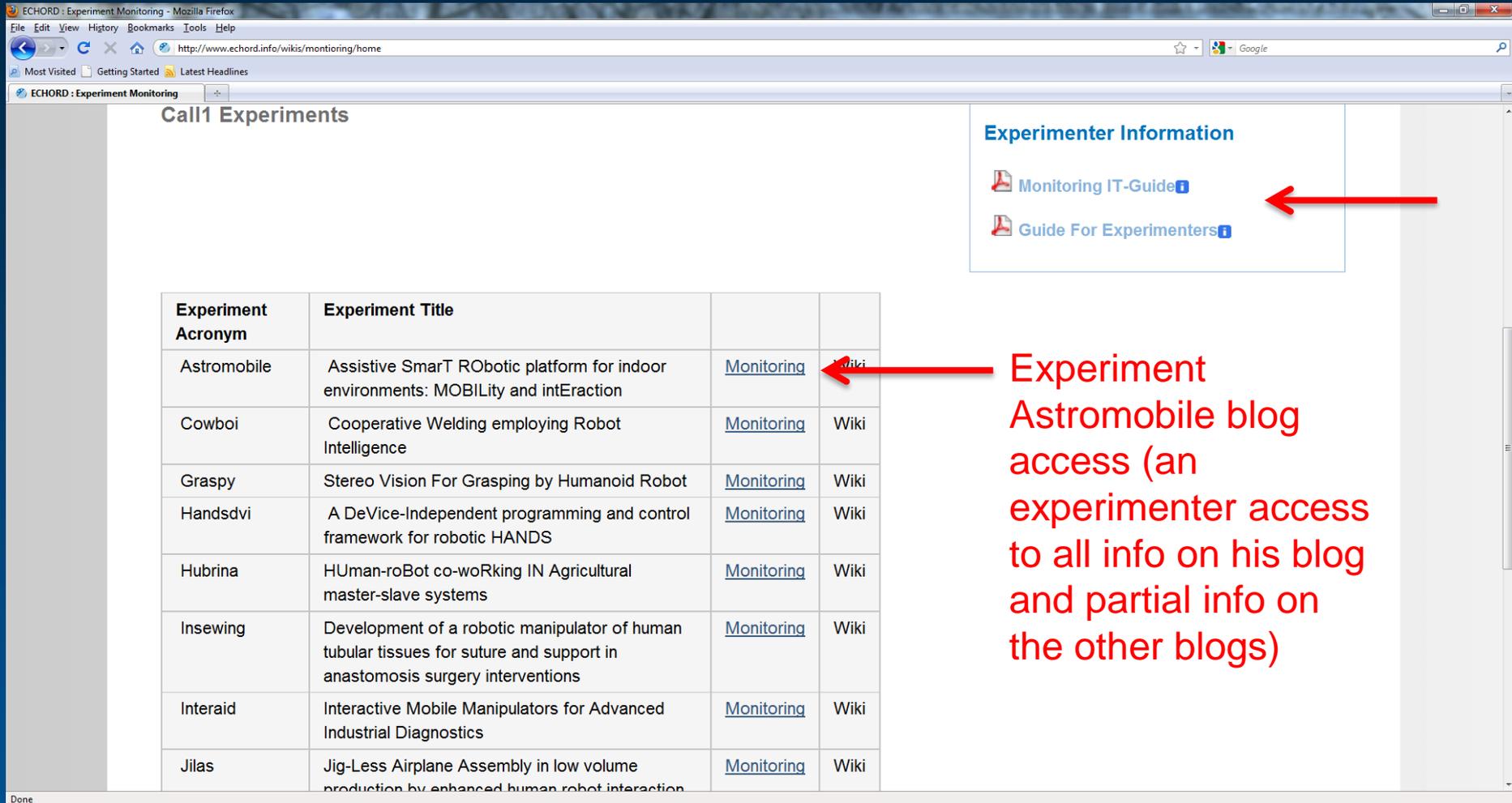
### The Project

ECHORD (European Clearing House for Open Robotics Development) is a new EU-funded project aiming to strengthen the cooperation between scientific research and industry in robotics. ECHORD is coordinated by Professor Knoll, Technical University of Munich. The project's international orientation and its positioning in the existing robotics landscape are

EU Robotics Forum

http://www.echord.info/wiki/allWikis

# IT-Platform: main page of the IT-platform

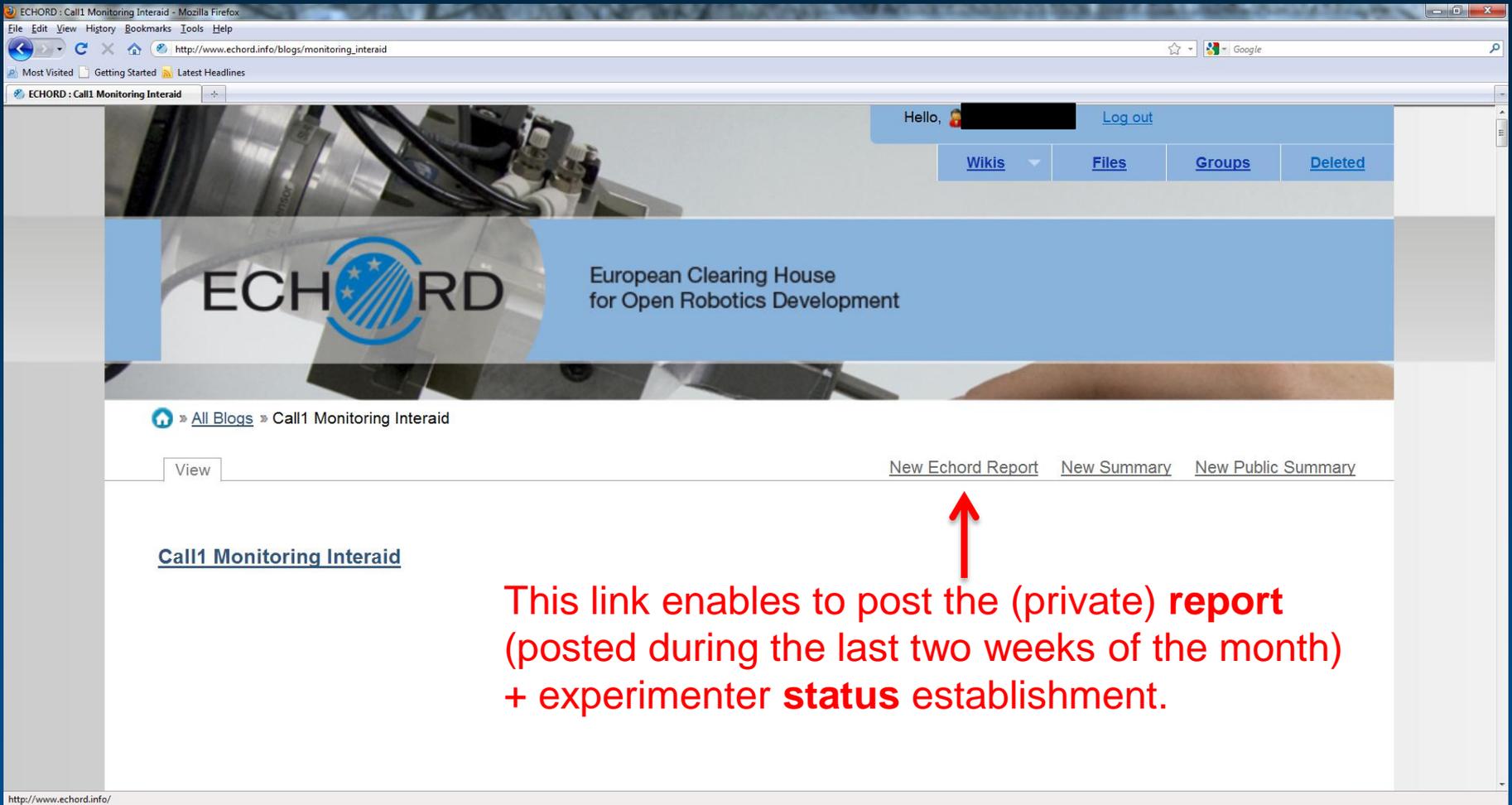


The screenshot shows the main page of the ECHORD Experiment Monitoring IT-platform. The page title is "Call11 Experiments". On the right side, there is a sidebar titled "Experimenter Information" containing two links: "Monitoring IT-Guide" and "Guide For Experimenters". A red arrow points from the "Monitoring IT-Guide" link to the text on the right. Below the sidebar is a table with the following data:

Experiment Acronym	Experiment Title	Monitoring	Wiki
Astromobile	Assistive Smart Robotic platform for indoor environments: MOBILity and intERaction	<a href="#">Monitoring</a>	<a href="#">Wiki</a>
Cowboi	Cooperative Welding employing Robot Intelligence	<a href="#">Monitoring</a>	<a href="#">Wiki</a>
Graspy	Stereo Vision For Grasping by Humanoid Robot	<a href="#">Monitoring</a>	<a href="#">Wiki</a>
Handsdvi	A DeVice-Independent programming and control framework for robotic HANDS	<a href="#">Monitoring</a>	<a href="#">Wiki</a>
Hubrina	HUman-roBot co-wORKing IN Agricultural master-slave systems	<a href="#">Monitoring</a>	<a href="#">Wiki</a>
Insewing	Development of a robotic manipulator of human tubular tissues for suture and support in anastomosis surgery interventions	<a href="#">Monitoring</a>	<a href="#">Wiki</a>
Interaid	Interactive Mobile Manipulators for Advanced Industrial Diagnostics	<a href="#">Monitoring</a>	<a href="#">Wiki</a>
Jilas	Jig-Less Airplane Assembly in low volume production by enhanced human-robot interaction	<a href="#">Monitoring</a>	<a href="#">Wiki</a>

Experiment Astromobile blog access (an experimenter access to all info on his blog and partial info on the other blogs)

# IT-Platform: how to post the report



The screenshot shows a web browser window displaying the ECHORD website. The browser's address bar shows the URL [http://www.echord.info/blogs/monitoring\\_interaid](http://www.echord.info/blogs/monitoring_interaid). The website header includes the ECHORD logo and the text "European Clearing House for Open Robotics Development". A navigation menu contains links for "Wikis", "Files", "Groups", and "Deleted". A user is logged in, indicated by "Hello, [redacted] Log out". Below the header, there is a breadcrumb trail: "» All Blogs » Call1 Monitoring Interaid". A "View" button is visible. In the top right corner of the content area, there are three links: "New Echord Report", "New Summary", and "New Public Summary". A red arrow points to the "New Echord Report" link. Below the screenshot, a red text box explains the purpose of this link.

[New Echord Report](#) [New Summary](#) [New Public Summary](#)

**This link enables to post the (private) report (posted during the last two weeks of the month) + experimenter **status** establishment.**

# IT-Platform: how to post the report

The screenshot shows the 'Create New Post' form in a Mozilla Firefox browser window. The browser address bar shows the URL: <http://www.echord.info/logBook/newEchordReport?id=1ptvdbeqq9ivu>. The page header includes the ECHORD logo and the text 'European Clearing House for Open Robotics Development'. The form has a 'Save' button and a 'Cancel' button. The 'Title' field contains 'ECHORD Report Month 1/2011'. The 'Finished' checkbox is checked. The 'Status' dropdown menu is set to 'yellow'. The 'Comment' field is empty. The 'Tags' field contains 'acromvm' and 'focus'. A red arrow points to the 'Status' dropdown menu, and another red arrow points to the 'Comment' text area.

Status set by the experimenter (traffic light)

The text of the report is entered here, illustrations can be included

# IT-Platform: example of posted report

ECHORD : Call1 Monitoring Interaid - Mozilla Firefox

File Edit View History Bookmarks Tools Help

http://www.echord.info/b

Most Visited Getting Started Latest Headlines

ECHORD : Call1 Monitoring Interaid

ECHORD  
European Clearing House  
for Open Robotics Development

Call1 Monitoring Interaid

Tags: [echord report](#), [public summary](#), [summary](#)

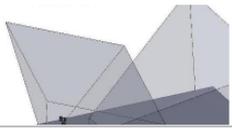
Pages: [10345678](#), [9101112](#)

Task 1: Prototype integration

- Definition of requirements for 3D environment sensors.
  - Critical requirements: minimal range for depth information at least 0.6m, minimal field of view 60°x70°, low-cost multiple sensors (in total less than 3000€)
  - Secondary requirements: depth accuracy, resolution
- Comparison and evaluation of a first set of 3D sensors in order to fulfill the requirements of the experiment.
  - Different 3D sensors have been compared and evaluated regarding the requirements mentioned above
  - Two sensors with different characteristics have been chosen to be used on the robot: The Microsoft Kinect Sensor will be mounted on the base to be used for navigation. The main reasons for that are:
    - Sensor is cheap (approximately 150€)
    - Wide field of view (approximately 62° x 61°)
    - Minimum distance is relatively big (approximately 1m), but enough for navigation because sensor is looking down and navigation is supported by a laser scanner
  - The PMD CamBoard will be used to supervise the workspace of the arm. The main reasons for that are:
    - Sensor is quite expensive compared to Kinect, but still affordable
    - Wide field of view (approximately 72° x 70°)
    - Small minimum distance (approximately 0.15m), therefore the sensor can be mounted and moved close to obstacles

Camera	Angle of View (°)		Minimum Range (m)
	Horizontal	Vertical	
Kinect (Microsoft)	63,27	61,48	1
CamBoard (PMD)	72,16	70,16	0,15

A preliminary solution for the integration of the sensors, the arm and the mobile platform based on experimental and simulation results has been designed. The location of the sensors on the arm (2D camera, microphone and 3D sensor) has been selected in order to maximize the mobility of the arm, the view of the sensors and the easiness of mounting. The location of 3D sensors has been chosen in order to make the movement of the arm and platform as safe as possible considering the field of view of each sensor as depicted in figure 1.



ECHORD : Call1 Monitoring Interaid - Mozilla Firefox

File Edit View History Bookmarks Tools Help

http://www.echord.info/b

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ECHORD : Call1 Monitoring Interaid

Figure 1 - 3D sensors field of view

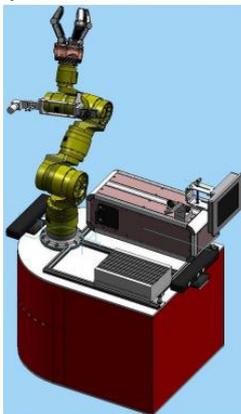


Figure 2 - Overall layout of the robot prototype

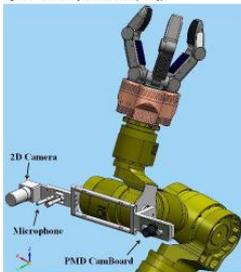


Figure 3 - Particular view of the sensors mounted on the roboto arm (2D camera, microphone and PMD CamBoard 3D sensor)



ECHORD : Call1 Monitoring Interaid - Mozilla Firefox

File Edit View History Bookmarks Tools Help

http://www.echord.info/b

Most Visited Getting Started Latest Headlines

ECHORD : Call1 Monitoring Interaid

Task 2: Implementation and integration of adaptive arm and platform controllers

- Control and communication architecture defined and communication trials performed.

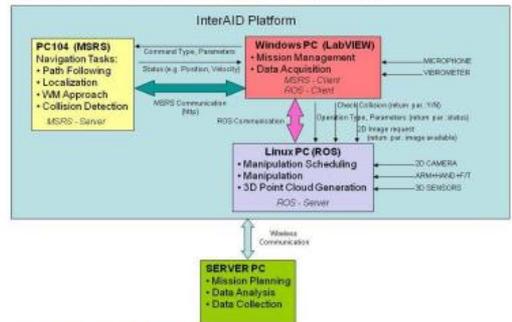


Figure 6 - InterAID platform overview.

As depicted in the figure 5, 3 PCs will be installed on the mobile robot, each PC has different tasks to execute, accordingly different operating systems and developing frameworks have been chosen:

- PC 104 controls the navigation of the mobile platform in the environment. Services running on PC 104 are programmed using Microsoft Robotics Studio because the mobile platform chosen for the experiment (RobotShop R3) has basic navigation services written for this framework.
- Windows PC manages the overall mission and acquires sensors (microphone, ultrasonic). Applications running on this PC are programmed using LabVIEW because it facilitates the acquisition of data.
- Linux PC controls robotic arm and robotic hand in the environment and measurement sensors positioning on the platform. It also receives data from 3D sensors to assure safe and collision free motion in the environment.
- SERVER PC manages the overall mission and acquires sensors (microphone, ultrasonic). Applications running on this PC are programmed using Python because it facilitates the acquisition of data.

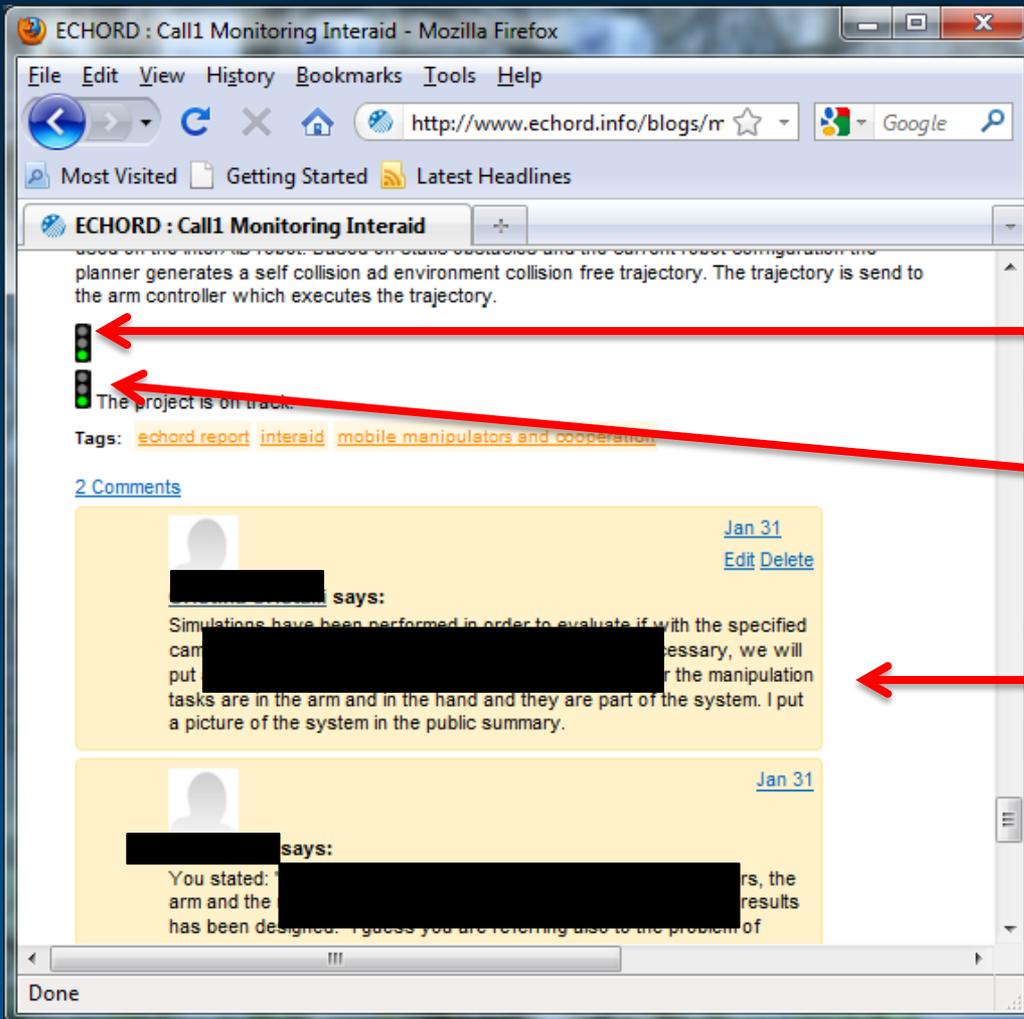
Still ongoing work with registration of 3D point clouds, evaluation, optimization, recording of sensor data from the robot in order to generate a 3D environment map by merging multiple view environment.

Development of a collision free path planning considering information.

The OMPL planning library provided as a ROS component is currently evaluated and adapted to be used on the InterAID robot. Based on static obstacles and the current robot configuration, the planner generates a self collision and environment collision free trajectory. The trajectory is send to the arm controller which executes the trajectory.

**status set by the experimenter: here green traffic light**

# IT-Platform: report review, status and blog discussion



Previous status set by the experimenter

Analysis and final status set by the moderator

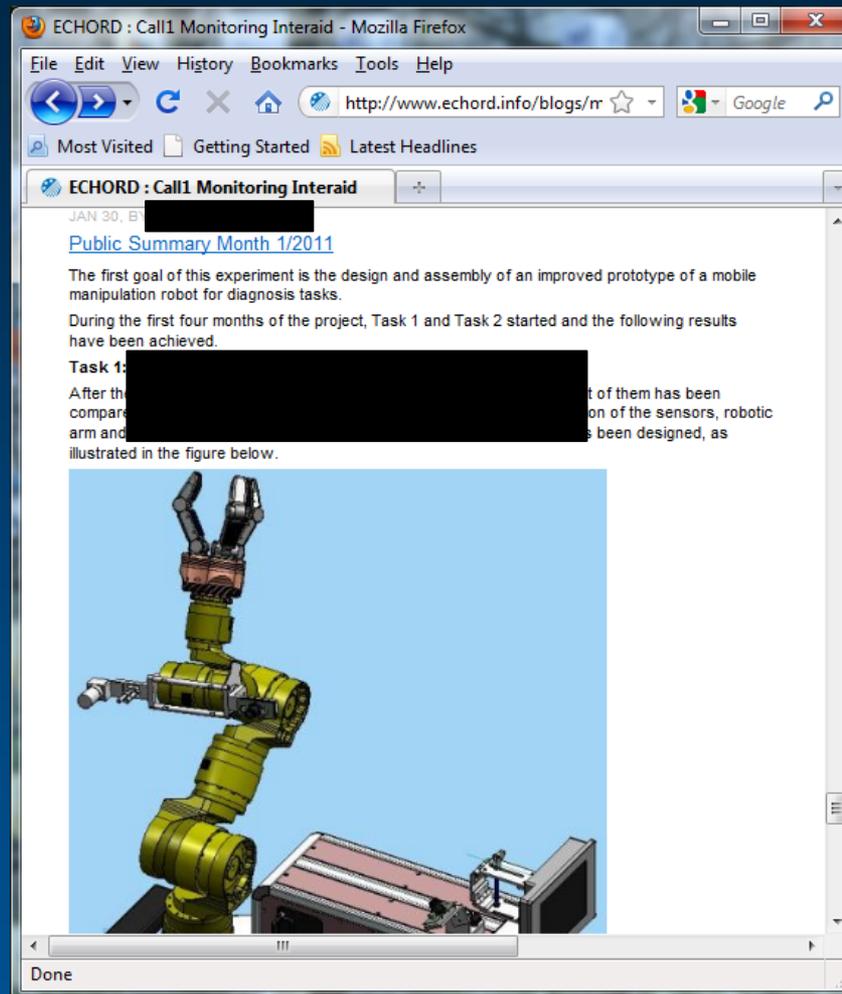
Blog discussion with the experimenter to agree on the summaries which can now be posted

# IT-Platform: how to post the summaries

The screenshot shows a web browser window displaying the ECHORD website. The browser's address bar shows the URL [http://www.echord.info/blogs/monitoring\\_interaid](http://www.echord.info/blogs/monitoring_interaid). The website header includes the ECHORD logo and the text "European Clearing House for Open Robotics Development". A navigation menu contains links for "Wikis", "Files", "Groups", and "Deleted". Below the header, there is a breadcrumb trail: "All Blogs » Call1 Monitoring Interaid". A "View" button is visible. In the main content area, there are three links: "New Echord Report", "New Summary", and "New Public Summary". Two red arrows point upwards from the text below to the "New Summary" and "New Public Summary" links. The text below the arrows reads: "These link enables to post the semi-public and the public summaries (posted before the end of the month)".

These link enables to post the semi-public and the public summaries (posted before the end of the month)

# IT-Platform: example of posted public summary



# Open discussion

- Networking opportunities within ECHORD
- Organization of joint workshops
- Organisation of special tracks
- Special issue in one of the major journals

# Thank you!

European Clearing House  
for Open Robotics Development  
[www.echord.info](http://www.echord.info)

