

# NJEx Mission Book -2012



Natural Human-Robot  
Cooperation in Dynamic  
Environments



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## **1 Welcome to NJEx 2012**

This mission book provides information essential to NJEx 2012:

- A schedule
- A team roster
- Mission briefs for the individual roles within a team
- Logistics for training with the NIFTi UGV and UAV platforms

## 2 Schedule

### 2.1 Tuesday 2 October

Time	Activity
10.00h	FDDO: Welcome, local organization and safety
10.30h	DFKI: Introduction to NJEx 2012
11.00h	Coffee break
11.30h	Parallel activities Unpacking of equipment Setup of working environment Indoor network setup (Internet)
13.00h	Lunch
14.00h	Parallel activities BLUE: upgrade of 2 UGVs Fraunhofer: assembly and test of arms FDDO/TNO: final setup of arena all: update of UGV software
16.00h	Coffee break
16.30h	Parallel activities BLUE: upgrade of 2 more UGVs Fraunhofer: test flights of UAV in arena all: final debugging of UGV software
18.30h	End of day

### 2.2 Wednesday 3 October

Time	Activity
09.00h	Fraunhofer: Summary of day 1 and schedule for day 2 Functional tests of all 4 UGVs as specified below
09.30h	Setup of NIFTi network Test of OCU - robot communication (remote control)
11.00h	Coffee break
11.30h	Test of vision capabilities (incl. arm)
13.00h	Lunch
14.00h	Test of autonomous navigation and mapping in 3D
16.00h	Coffee break
16.30h	Test of planning features
17.30h	Test of EOI visualization in TREX
18.30h	End of day

### 2.3 Thursday 4 October

Time	Activity
09.00h 09.30h - 11.00h  11.30h 11.30h - 13.00h	TNO: Introduction to daily training setup Parallel team activities Team Alpha: Freight train mission Team Bravo: task battery Prepare for 2nd mission Parallel team activities Team Alpha: task battery Team Bravo: Freight train mission
13.00h	Lunch
14.00h - 15.00h 15.00h - 16.00h 16:00h - 16:15h 16:15h - 18:00h 18.00h	Workshop on freight train mission (all) Session on status and planning of end-user evaluation (all) Coffee break Small tests on mission terrain End of exercises

### 2.4 Friday 5 October

Time	Activity
09.00h 09.30h - 11.00h  11.30h 11.30h - 13.00h	TNO: Introduction to daily training setup Parallel team activities Team Alpha: Freight train mission Team Bravo: task battery Prepare for 2nd mission  Team Alpha: task battery Team Bravo: Freight train mission
13.00h	Lunch
14.00h - 14.30 14.30h 15.30h	Workshop on freight train mission (all) Pack equipment and robots End

### 3 Teams and roles

Everyone will be part of a team, each team will collaborate during the missions and perform the task battery tasks.

#### 3.1 Teams

Team Alpha	Team Bravo
Norbert (FDDo)	Benoit
Slava (UAV)	Slava (UAV)
Francis	Srivatsa
Karel	Tomas P
Michal	Arnab
Zahid	Rainer

#### 3.2 Mission roles

Each team needs to assign its members specific *roles*, to facilitate the coordination and communication for the joint team efforts.

##### Mission Commander

- Remotely located
- Based on courses of action suggested by the Operations Trainer, instructs UAV and UGV to perform certain exploration actions
- Based on requests for UAV assistance from UGV Pilot, instructs UAV and UGV what to do (how to coordinate efforts)
- Interprets UAV video and mapping information
- Communicates UAV situation awareness to other team members, inside the voice loop

##### In-field rescuer

- In-field to rescue victims
- Communicates in the voice loop

##### Operator UGV-1

- Remotely located
- Operates the UGV
- Interprets UGV video and mapping information
- Communicates UGV situation awareness to other team members, inside the voice loop
- Communicates with the UGV Mission Commander to coordinate in-field UGV action, inside the voice loop

- Communicates with the Mission Commander to request and coordinate joint UAV and UGV actions, inside the voice loop
- Communicates with the Operations Trainer to receive suggestions for UGV actions, inside the voice loop

**Operator UGV-follow**

- Remotely located
- Operates the UGV-follow
- Helps out UGV-1 where necessary

**UGV Safety director**

- In-field with the UGV
- Guards the safety of the UGV, and of other proximal team members
- Communicates inside the voice loop with the UGV Pilot, to coordinate UGV actions

**Operator UAV:**

- In-field in line-of-sight of the UAV.
- Operates the UAV.
- Communicates outside of the voice loop with the UAV Safety Director

**UAV Safety director**

- In-field with the UAV
- Guards the safety of the UAV, and of other proximal team members
- Communicates inside the voice loop with the UAV Pilot, to coordinate UAV actions

## 4 Robots

Robots present and used for the missions, as back-up or for the task battery are:

- DFKI UGV: mission
- CTU UGV: mission
- Fraunhofer UAV: mission
- TNO UGV: task battery
- Roma UGV: back-up for task battery or mission

## 5 Task battery

Three task battery tasks will be performed and tested.

- Detect objects
- Area covered
- Collaboration game (needs two participants)

## 6 Test mission

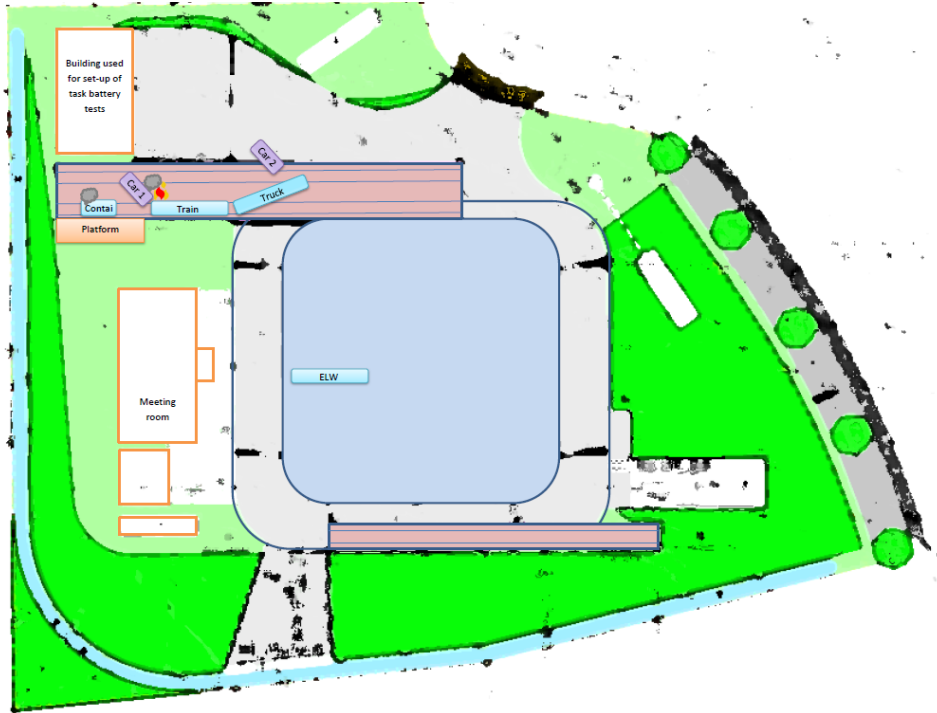



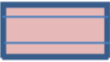


Figure 1: Set-up of test mission



Icon	Meaning
	Fire
	Building
	Smoke
	Tracks

## 7 Logistics

### 7.1 Important Locations

#### Hotel

NH Stadt Dortmund, Knigswall 1, Dortmund. +49-231-9055-0

#### NJEx location

The NIFTi joint exercises take place on the Ausbildungszentrum.

Ausbildungszentrum der Feuerwehr, Seilerstrae 15, Dortmund

To get there by tram (S-Bahn):

- At the main station, take the tram U41 Direction Brechten/Brambauer
- Get out at the Gtenstrae station
- The schedule for U41 is in the metro station; Green is weekdays.