Description of the scenario:

The traffic lights at a small railway station and the nearby crossing are not functioning well. Both the traffic lights for trains entering the station and for cars on the crossing right next to the platform are green. Because of this, a train entering the station crashed into a car crossing the tracks. Some other cars evaded the train just in time, but had to drive onto the tracks while evading the train. During this, one car crashed into a platform and another stopped just behind the train. The train was not driving very fast, so car occupants might have survived. They could be in need of medical attention.

The train was carrying dangerous chemicals, these seem to be leeking out. It might be dangarous for humans to go near the chemical spill. Also, one of the cars seems to be on fire. There might be an explosion risk, so the area around this car is also unsafe for humans to go into.

An USAR team is send into the area. The goal of the USAR team is to safely find and extract all victims. This team has four human actors with two robots:
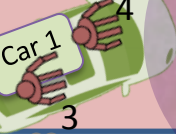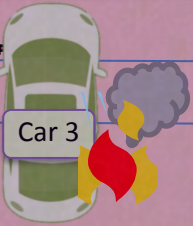
- The mission commander, which is played by an experienced commander from the Stadt Dortmund Fire Department (FDDO). The mission commander takes the lead and commands all other actors. It is his job to make sure the danger of the chemical spill is contained and all victims are rescued. He is located in a control center, he has no direct view on to the disaster site and is not allowed to go outside. He has two computer screens. One allows him to use TREX, which is a shared map in which all actors but the UAV driver can place icons locating victims, dangers, cars etc. The other screen allows the mission commander to see the rescue site trough camera images made by the UAV.
- The in-field rescuer, which is played by a different firefighter from FDDO in each trial. The in-field rescuer listens to commands of the mission commander. He can be used to go into the field and rescue victims. He has a hand-held device on which he can use/see TREX.
- The UGV operator, which is played by a different firefighter from FDDO in each trial. The UGV operator listens to commands of the mission commander and controls the UGV. The UGV can be used to map the scene, also in areas that are not safe for the in-field rescuer to go in. The UGV can also measure a chemical spill, retrieving information about how dangerous it is. The UGV operator has two computer screens, one to operate the UGV and one to use TREX.
- The UAV operator, which is played by an experienced UAV operator from the NIFTi team. The UAV operator listens to commands of the mission commander and controls the UAV. The UAV can be used to give an overview of the scene, by flying over it. The UAV operator is outside, near the scene.
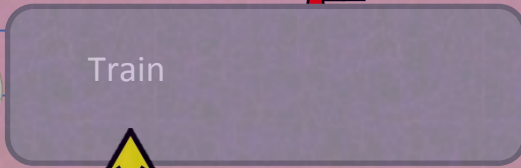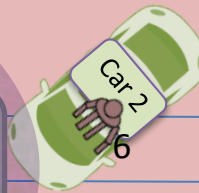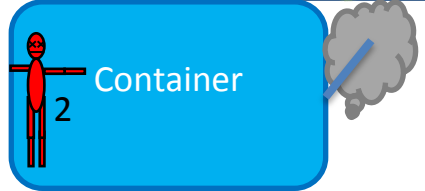
Legend

Icon	Meaning		Icon	Meaning
	Fire			UGV
	Building			UAV
	Smoke			Sound is played from here
	Tracks			Something will fall here
	Sitting victim (no thermo pack)			Chemical Spill
	Lying victim (with thermo pack)			Area dangerous for humans

Objects needed for set-up of scenario:

- 1 train wagon
- 1 truck
- 3 cars
- 1 container
- 2 smoke machines
- 1 fire machine
- Obstacles in container and scattered around area (beamers, sleepers, tires)
- 7 Victim dummies (victims 1 and 5 should be medical dummies)
- 2 sound systems
- 1 extra platform (length: 8-10m, height: 1 m)

Other remarks:

- Two victims in car 1 (one on passenger seat, one in the back)
- One victim in car 2
- One victim under train
- One victim behind car 3
- One victim in the back of the truck
- One victim in container, near window
- Smoke in the container
- Smoke and fire near car 3
- In the container some objects:
    - Boxes (stacked and incrossable by UGV)
    - Beams (crossable by UGV)
- On the tracks there should be some tires and (for instance) car doors lying around

The following pages show building blocks of the script that the Wizards-of Oz (WoZ) and Mission Commander (MC) use to build up the scenario during an evaluation

Step	Actor	Target	Action	Notes
			Preparation	
001	WoZ_in-field		Start victim (1) sound (continuous loop, soft) in car 3	
002	WoZ_in_field		Start smoke machines and fire machine	
			Initial exploration	
100	MC	UAV-operator	Explore zone around wagons	
101	UAV operator		Explores area	
102	UAV operator	MC	Inform about possible leakage train next to platform 2	
103	MC	TREX	- Input information from UAV exploration - leakage area, with SQ to UGV operator - Train wagon - Cars - Structure (container) - Smoke	
104	TREX	In-field rescuer	In-field rescuer gets a notification about a hazardous material on the scene and knows not to go near that area.	
105	MC	In-field rescuer	Notify of assignment to go in field and rescue victims in car, but also mention chemical spill and no-go area (platform 2 + train)	

Step	Actor	Target	Action	Notes
			Measure chemical spill	
305	MC	In-field rescuer	Rescue victims in cars	
310	MC	UGV-operator	Tell UGV operator to proceed to train wagon to platform 2	
315	UGV operator	OCU	Navigate to platform Find stairs Go up stairs	
316	WoZ_in-field		Throw over pallet/plate on platform	Does this make enough noise? It will also make it more difficult to exit the platform
319	UGV operator	OCU	Find chemical spill Measure chemical spill (by voice control or input in OCU)	
320	OCU	UGV-operator	UGV measures and is shown busy in the OCU (5 minutes)	
325	OCU	UGV-operator	UGV gives information of chemical spill measurement by giving results on OCU	
327	WoZ_in-field		Start victim (5) sound (1 time, loud) under train	
330	WoZ_UGV	TREX	UGV adds substance information to Hazardous Materials Form in Trex	
335	UGV	UGV-operator	Measurement value is added on TREX	
340	TREX	MC	Mission Commander gets a strong notification about the answer to his smart question	
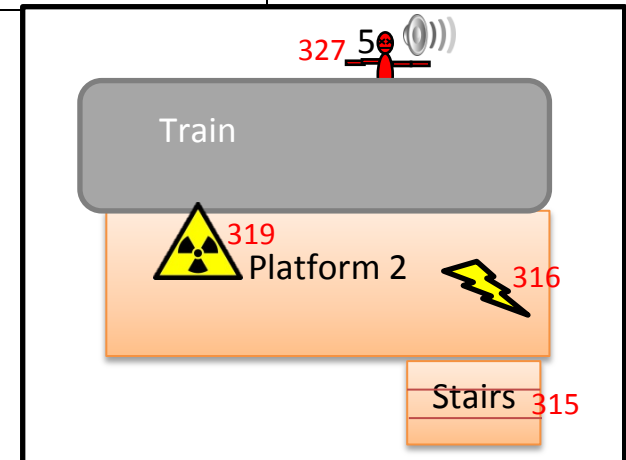
Step	Actor	Target	Action	Notes
			Explore area around car 3	
200	MC	UGV-operator	Go to car 3 and explore area (?) first from platform 1 to get a clear view of car without standing in the smoke or near fire	
205	UGV-operator	OCU	Input waypoints on OCU	
210	UGV		Navigate to waypoints	
212	WoZ_in-field		Click heat pack and put on victim (5) under train	
215	WoZ_in-field		When UGV is near train, start victim (5) sound (1 time, loud) under train	
220	WoZ_in-field		Click heat pack and put on victim (1) in car 3	Walk behind container and car 3
225	OCU	UGV-operator	Victim (5) shows on thermal image	
227	UGV-operator	MC	Notify of possible victim (5) near current location	
229	MC	TREX	If UGV-operator does not add victim (5) to TREX, MC should do so	
230	MC	In-field rescuer	Go to victim (5) under train	
235	MC	UGV-operator	Proceed to platform-1	
240	UGV-operator	OCU	Input waypoints on OCU	
245	UGV-operator	OCU	When robot has arrived look on thermal images and search for victims or fire	
247		UGV-operator	Hear victim (1) sound coming from car 3	
250	MC	UGV-operator	Ask about situation around/in car 3	
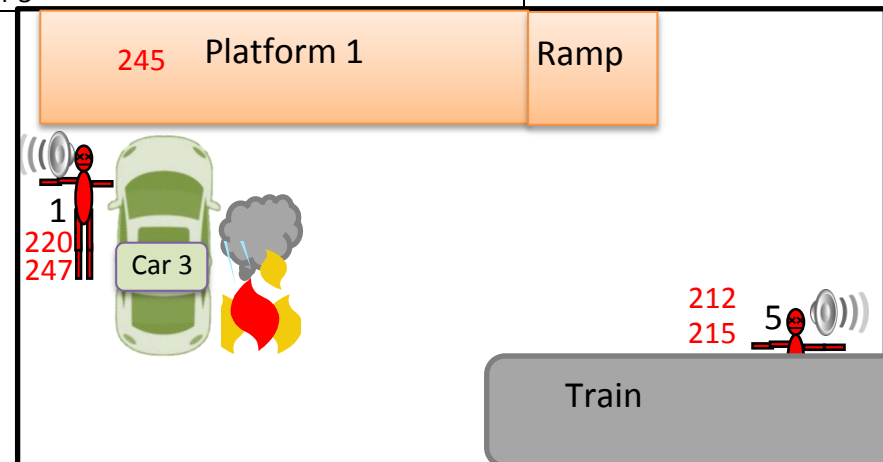
Step	Actor	Target	Action	Notes
			In-field rescuer explore container or truck	
405	MC	In-field rescuer	Assign in-field rescuer to task: explore container or truck	
410	In-field rescuer	MC	Enter container or truck, keep MC up to date	There is a victim inside, but it may be that victim is not found, if there is time it is an option to send UGV inside container

Step	Actor	Target	Action	Notes
			UGV explore container	
420	MC	TREX	Add SQ to Trex to explore container	
425	MC	UGV operator	Ask UGV operator to explore container for possible victims with thermal camera image	
427	WoZ_in-field		Click heat pack and put on victim in container	Victim is located under window (far end of container) click heat pack outside and throw on victim
430	UGV operator	OCU	Input waypoints on OCU	
440	UGV operator	UGV	Pay attention to thermal and laser images inside container	