



AAL JP – project ASSAM

# Annotation of Test Environments – A

## *Deliverable D4.1-A*

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Abstract: This document details the annotation of test environments as done during the first iteration of the annotation process of the project.

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Version history:

Date	Author	Content
2013-06-03	Schröder, NMS	Initial version
2013-09-02	BKB, DFKI	Slight formatting
2013-10-17	Rafa, CVI	Added CVI surroundings annotations and photos
2013-10-31	Schröder, NMS	Additional information on CVI testing
2013-11-04	Schröder, NMS	Information on BART testing
2013-11-14	BKB, DFKI	editing
2013-11-14	Schröder, NMS	editing

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## 1. Scope of the First Annotation Iteration

The first annotation iteration was scheduled before the first evaluation trials in order to ensure that valid map data are present at the testing sites. At the current stage of ASSAM, we work exclusively with the official OSM tags<sup>1</sup>.

Collecting values for every possible tag for an area would prove very time-consuming. For this reason, the scope for this iteration was to collect all necessary data to enable routing of the user of a walker. Additionally, to enable the test users to progress at their own pace, we gathered points of interest (POIs) such as benches which would allow the testers to rest during the trial.

All annotated data were sent back to the OSM database and are now publicly available.

## 2. Annotation of Test Sites in Germany

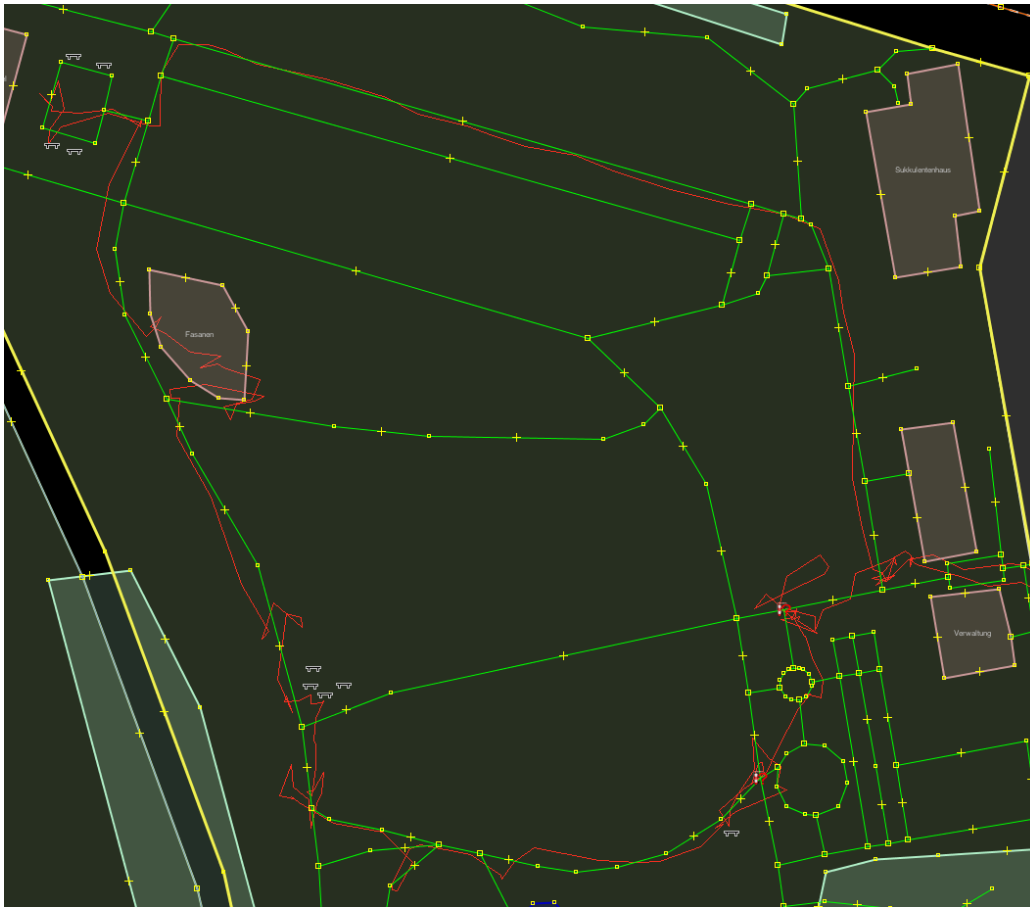
During the planning of the evaluation, it was still unclear where the German tests would take place. The usability of the areas in Oldenburg depended on the weather conditions. Additionally, the selection of the German test sites would depend on where the participants of this trial live, to ensure that it would not be too taxing for them to travel to the test sites. In the following, all German test sites and the steps undertaken at them are presented. All logged data and shot photos from these sessions can be found in the git repository at `ssh://git@nyx.informatik.uni-bremen.de/Assam.git` (access provided by DFKI) in the "miscfiles" subdirectory.

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<sup>1</sup> [http://wiki.openstreetmap.org/wiki/Map\\_Features](http://wiki.openstreetmap.org/wiki/Map_Features)

## 2.1 Annotation of Botanischer Garten, Oldenburg (2013-02-05 + 2013-02-07)

The existing map data of the area were inspected in JOSM<sup>2</sup> prior to the annotation event. The area was already annotated for general use, thus it was not deemed necessary to map the entire garden, but only to examine routes suitable for testing. These routes were inspected by foot, while the annotators carried a Garmin Montana 650t<sup>3</sup> GPS device with them.



*Figure 1: GPS track of Botanischer Garten*

Figure 1 shows the GPS path travelled in this session. All files from this session were checked into the repository given above with commit 9ab7159cde3a6e0861d9c018f77f489bc39fd19f.

During the inspection of this area, the width, surface and smoothness of the testing route's paths was noted at relevant locations using the waypoint function of the Garmin. This was also used for points of interest. The following waypoints have been captured during this session:

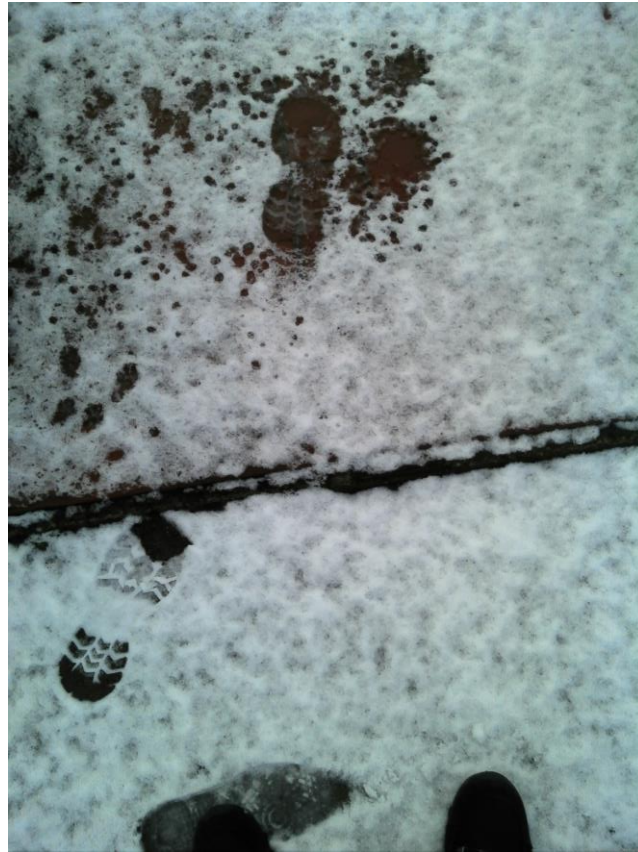
- The width, surface, materials and/or smoothness of five roads
- Three benches
- One hole
- Tree roots at one location

The waypoint file can be found in the repository.

Where necessary, photos were taken using the camera of the device to make note of obstacles and surface properties. Each photo contains the GPS location where it was taken. These photos were taken:

<sup>2</sup> <http://josm.openstreetmap.de>

<sup>3</sup> <https://buy.garmin.com/de-DE/DE/outdoor-freizeit/handgerate/montana-650t/prod75228.html>



*Figure 2: A ridge across the path*



*Figure 3: Long branches possibly blocking a road*





*Figure 4: The stone ridge of a way branching off the main road*



*Figure 5: A surface that becomes muddy and possibly inaccessible during rainy weather*





*Figure 6: Two benches*



*Figure 7: Another muddy spot*





*Figure 8: Roots covering a larger part of the road*



*Figure 9: A path consisting just of stone plates*



The GPS also recorded the whole traversed path for later verification of the existing map data. This file is also found within the repository given above.

After inspecting the route, the path objects in the OSM database were tagged with the gathered data. They were also verified to be connected in a way that enables the routing algorithm to work correctly with them.

All editing was done with the JOSM<sup>4</sup> editor on 2013-02-07. All the changes have been uploaded to OpenStreetMaps on that day. This created changeset 14945122, which can be viewed at <http://www.openstreetmap.org/browse/changeset/14945122>

## 2.2 Annotation of Bürgerpark, Bremen (2013-02-21 + 2013-02-22)

At this location, the properties for surface, smoothness, and width were recorded. Additionally, the location of amenities (benches, trash cans, lanterns), traffic signs, cycle parking, information signs and bridges was tracked. For paths and bridges, their incline and decline was measured. We began tracking tree locations in this session in order to be able to determine whether any GPS interferences are caused by trees. In case of forest areas, amenity=forest was used; natural=tree denotes individual trees.

The Garmin Montana was used again to track the paths and verify their nodes.



*Figure 10: GPS track recorded during Bürgerpark annotation*

The changes were uploaded to OpenStreetMaps on 2013-03-06, creating changeset 15273494 on the server. Thus, the list of changes can be accessed at <http://www.openstreetmap.org/browse/changeset/15273494>

All files from this session were checked into the repository given above with commit 6e2e00deb9861b8afa8769a2effd31aa54c43c65. Where necessary, photos were taken to make note of obstacles and surface properties. These photos were taken:

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<sup>4</sup> <http://josm.openstreetmap.de>



*Figure 11: Surface of a road segment*



*Figure 12: Bridge surface*





Figure 13: Information sign



Figure 14: Sandy surface, gate





*Figure 15: Muddy road (depending on weather conditions)*



*Figure 16: Grass area*



*Figure 17: Fenced area*



## 2.3 Annotation of Schloßgarten, Oldenburg (2013-04-16)

During this session, ca. 80% of the Schloßgarten was annotated. Besides the width, surface and smoothness, this time a wider range of amenities (benches, trash cans, lanterns) were gathered, as well as information signs (e.g. maps), bridges and forest areas.

For this testing site, the map data was verified using a smartphone. The signal variance of ca. 5 metres made comparing the GPS tracks to the existing paths a bit difficult in this case. All files from this session were checked into the repository given above with commit 421024b26a3415f43f4bde23870d52d6cb798ea9.



Figure 18: GPS track recorded during Schloßgarten annotation



Where necessary, photos were taken to make note of obstacles and surface properties. These photos were taken:

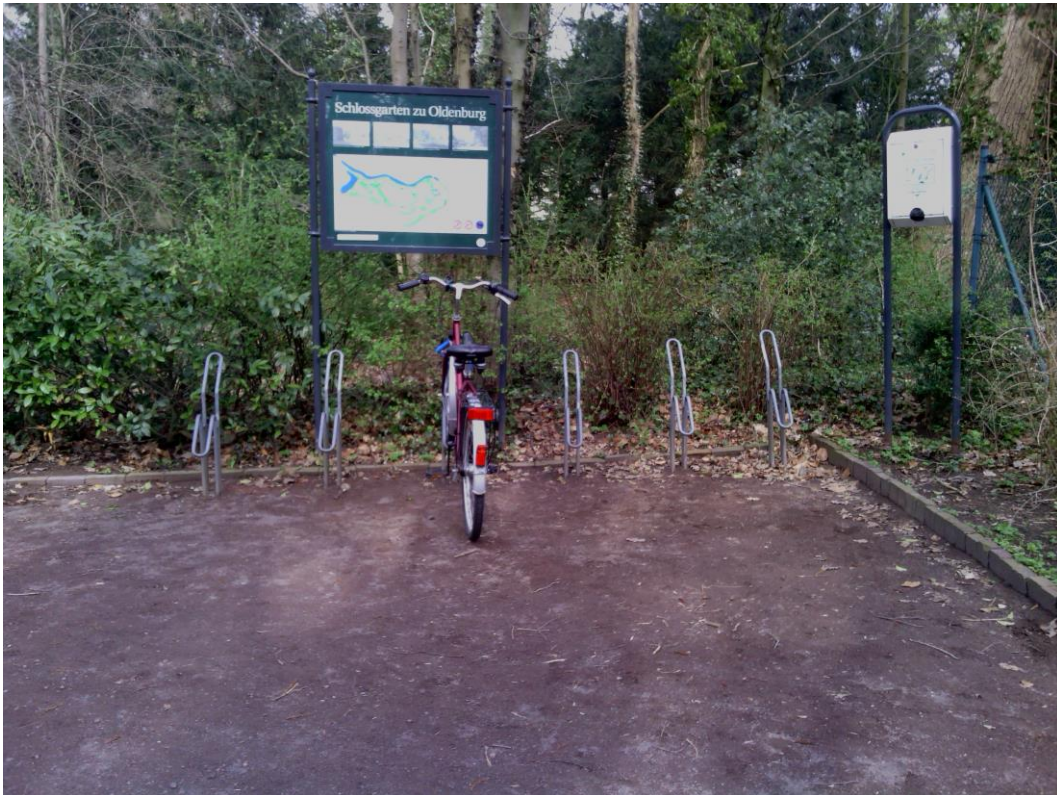


*Figure 19: Bench / resting area*



*Figure 20: Gate (may be closed)*





*Figure 21: Map sign and bicycle rack*



*Figure 22: Road prone to muddiness*

## 2.4 Annotations of Vall Hebron, Barcelona (2013-07-08+2013-09-09)

During the first session most of the area was annotated. This includes the streets, stairs and underground pass, elevator, the playground zone and their benches, supermarket and the snack bar near the metro entrance. Also we added the ground type of each street, but there is still left to add the inclination of them. On the second session we finished correcting some surfaces, adding the intersections on some streets that were left, pedestrian crossings and trash cans. We also had to edit some modifications that were done by someone else that moved things incorrectly.

In this session, no GPS track was recorded. All edits to OpenStreetMaps can be accessed at <http://www.openstreetmap.org/user/rheed/edits>.



*Figure 23: Slope at CVI entrance*





*Figure 24: Slope on elevator entrance*



*Figure 25: Terrain differences*



*Figure 26: Downhill*





*Figure 27: Slope near the playground*



*Figure 28: Sand playground with two benches*





*Figure 29: Supermarket uphill*

## 2.5 Annotations of Bartimeus, Doorn (2013-04-18+2013-04-21)

During these sessions, two routes were planned and annotated on the Bartimeus site in Doorn, NL. They are shown in figures 3 and 4.

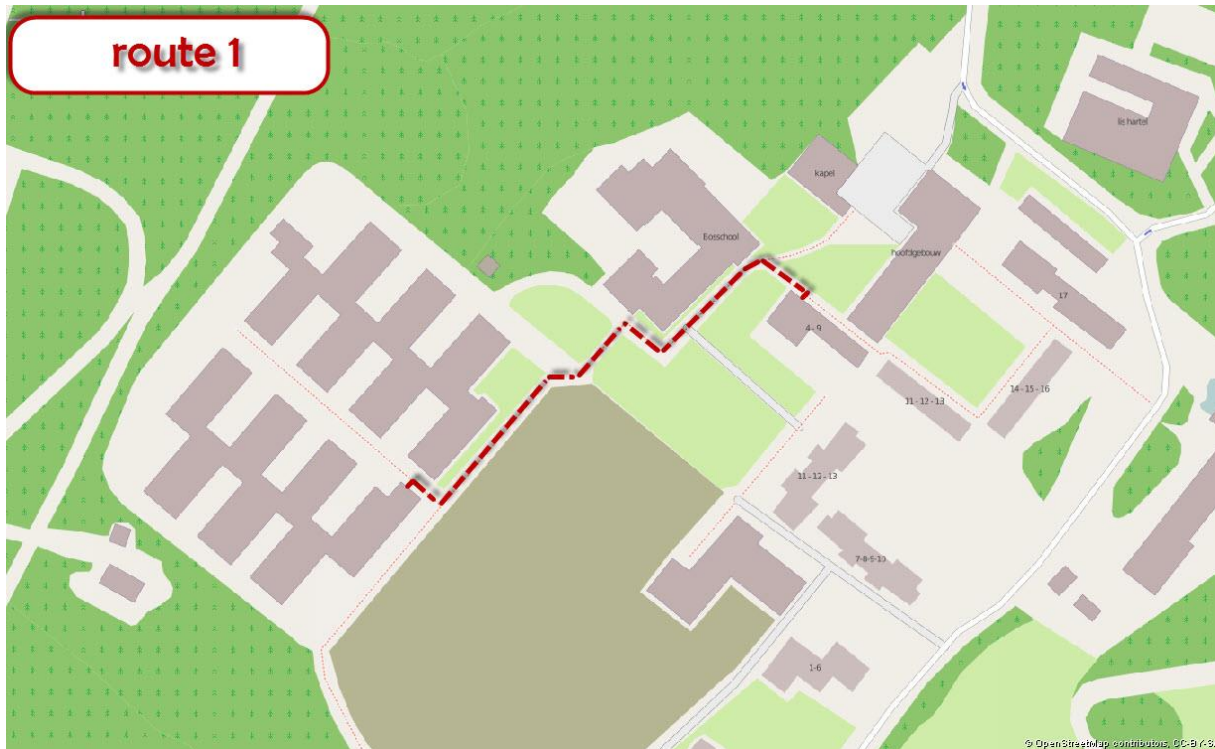


Figure 30: Route 1 Bartimeus

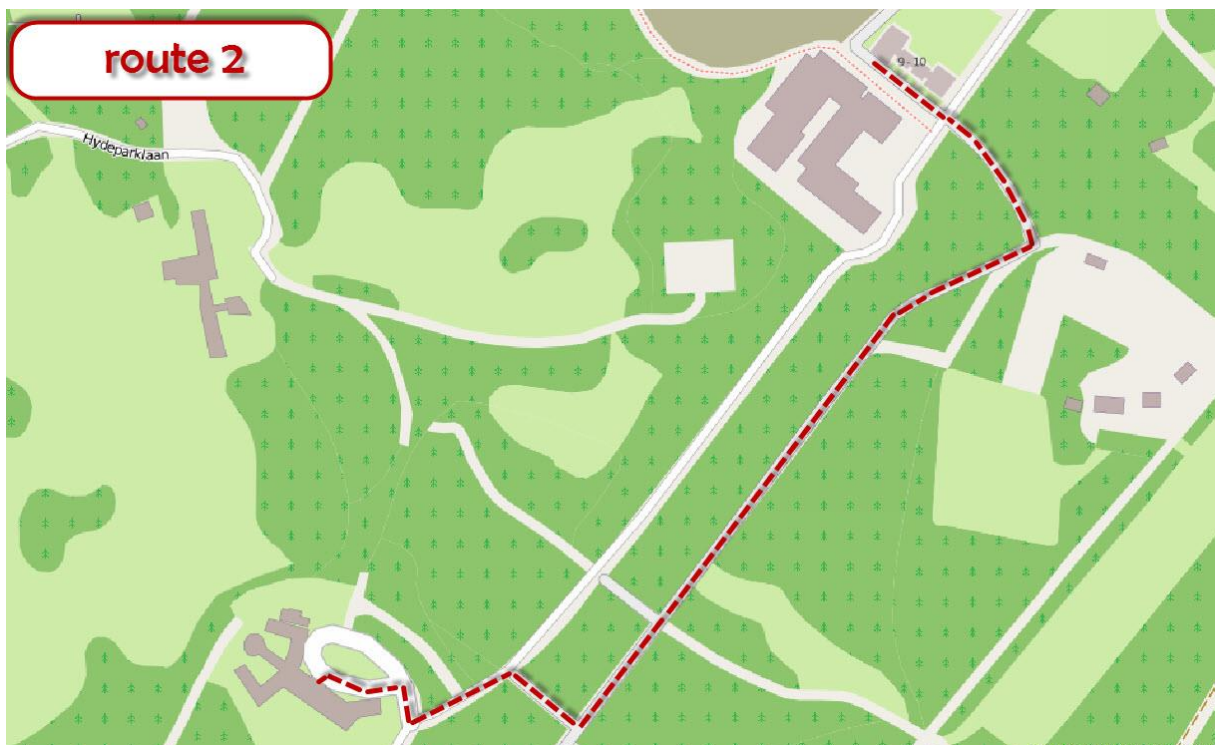


Figure 31: Route 2 Bartimeus

During the annotation, older buildings which no longer exist were removed from the OSM data set. New buildings that were constructed in 2012 were added to the data set for the area, as well as paths surrounding and connecting them. A comprehensive list of all added and removed data can be accessed at <http://www.openstreetmap.org/user/dlunenburg/>



Additionally, a number of photos were captured to document the annotation process.



*Figure 32: Documenting the annotation process*



Figures 5 and 6 show the OSM representation of the environments surrounding the routes after uploading the edits.



*Figure 33: Route 1 environment*



*Figure 34: Route 3 environment*