Exersice: GNSS-based positioning with Avenza Maps and your smartphone

Objective of the Exercise:

In this exercise, you will use the GNSS functionality of your smartphone to track a route and measure points using the Avenza Maps app. This app works on both Android and iOS, making it the best choice among available open-source/free applications. Afterwards, you will upload the CSV of the points to a small browser app to get a visualization.

Tasks:

1. Track the path
2. Measure points
3. Upload the data

Procedure:

Formation of pairs:

Work in pairs. One person will be responsible for tracking the path and can simultaneously have the PDF open with the point characteristics, while the second person measures the points along the route.

Preparation at home:

1. **Install the Avenza Maps app** on your smartphone.
2. Ensure that **GPS is enabled** on your smartphone.
3. Download the GeoPDF (**Download geoPDF file here**) and import it into Avenza Maps or simply scan the QR code in Avenza Maps, **so you can find and orient yourself along the path**.

Figure 1: QR Code GeoPDF with track

4. Download the Avenza How-To PDF or print it out (or try it out at home), so you know how to enter points and track paths.

   Download avenzamaps-howto file here

5. Also download the **points (KMZ file including images)** and open them in Avenza Maps (you can easily import the layer and scan the QR code):

   Download 03.kmz file here

Figure 2: QR Code 03.kmz

The points include example images of what you should measure. You can overlay these on the GeoPDF in Avenza Maps. It is sufficient if the person tracking has this visible. The other person would otherwise have too many points on the map for measuring.

Please help each other if something doesn't work!

Task 0: Configure Avenza Maps

- Ensure that you can see the map with the path and the predefined points. By clicking on each point, you can see a description and an image of what you should measure.
- Make sure to create a new layer for your own data and set it as active!

Task 1: Track the path

One person in the team is responsible for continuously tracking the path and keeping an overview. Always stay on the designated path, e.g., on the right side of the path if it is quite wide. Avoid deviating from the path (do not go into the forest, etc.). If you need to leave the path, make sure the device stays on the path (e.g., temporarily give it to the other person). Additionally, the person tracking (this primarily runs in the background) can have the PDF with the point characteristics ready to find the points you need to measure.

Record the entire loop without gaps.

Task 2: Measure points

The second person should **measure specific points along the route** during the loop. These points are prominent locations that are easy to identify on the map (e.g., intersections, viewpoints, benches, corners, etc.). They are predefined!

Use the Avenza Maps app to mark these points directly on the map. Number the points according to the scheme A, B, C, … and indicate the sky coverage (e.g., shaded by trees) in tenths of a percent, i.e., a **number between 1 (10% covered) and 10 (100% covered).** Write this in the "Description" field.

After completing the route, export the **tracked path as GPX** and the **measured points** from Avenza Maps as **CSV**.

Task 3: Submission or Upload

Now comes the exciting part (for us too!):

Please upload the GPX and CSV to the following website:

- https://geosense.shinyapps.io/shinyapp-03-msc/
- And send the GPX and CSV files in a ZIP archive to Maximilian Fabi: maximilian.fabi@geosense.uni-freiburg.de

You can directly follow the results there. The app will be activated on the field day and will update after each upload. The first team to upload the files will not see much yet. But as more teams upload their data, we will (hopefully) recognize some patterns :).

Required Materials:

- Smartphone with GPS
- Avenza Maps (free version)