



Section Sciences et Ingénierie de l'environnement Design Project 2024 (semestre de printemps)

Proposition n°24

Accuracy assessment of precise mapping with mobile phone

Partenaire externe ou laboratoire IIE

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Encadrant EPFL (proposition facultative qui sera validée par la Section)

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Descriptif du projet

Since 2011, Pix4D has been on a mission to democratize photogrammetry thanks to its easy to use software tools for geospatial and other professionals. Mapping with mobile devices is gaining popularity across many fields thanks to the recent advancements in phone-image quality as well as additional hardware and software developed by Pix4D. One of these tools is the PIX4Dcatch app, that turns any mobile device into a mapping tool. Coupled with the cm-level GPS real-time positioning device (viDoc RTK), a consumer-grade mobile device such as the iPhone 15 Pro can be used for accurate mapping and 3D modeling in different domains (e.g., accident scene reconstruction, surveying, etc.)





The objective of this project is to assess the accuracy of an iPhone 15 pro within the postprocessing photogrammetric workflow of PIX4D (PIX4Dcatch RTK). The students are expected to compare qualitatively this approach with reference methods and equipment used for mapping and surveying.

Objectif et buts

The objective is to assess the usability and accuracy of the iPhone 15 Pro with PIX4Dcatch and viDoc RTK mobile mapping system in the following scenarios:

- **Single point measurements** using a professional surveying GNSS RTK rover and iPhone 15 Pro with viDoc RTK. The objective is to compare them side by side and discover their limitations.
- **Volumetric measurements** using a terrestrial scanner or a drone against the iPhone 15 Pro with viDoc RTK. The objective is to compare the workflow and accuracy of the measured volumes.
- (optional) **Case study** of a combination of terrestrial and aerial data. The objective is to design and perform a case study showcasing the benefits of combining aerial and terrestrial data.

Descriptif tâches

- Short literature/market review on the technology
- Learn how to use Pix4D software tools and viDoc RTK
- Data collection
- Data processing in PIX4Dmatic and PIX4Dsurvey
- Work with output from the experiment to make a pipeline of how to process this data.

Divers

The student will have to come to Pix4D SA in Renens, VD several times. The iPhone 15 pro and viDoc RTK as well as licenses of the Pix4D software will be provided, so the guidance in data collection.

The students will have a chance to spend some time with the developers and product managers of the leading software company in the geospatial field. Pix4D certification will be also provided for free. They will also have access to RTK-drone or other applications needed to make the required comparisons.

This design project should be written in English.





Prerequisite: Due to the required competences the students have to follow concurrently the master course ENV-408 Sensing and Spatial Modeling for Earth Observations.