Mapillary-RTK Project

We are a group of 4 students in Polytech engineering school. It's our last semester and we have to make an end-of-studies project. In this poster we will explain to you all you have to know about our project.

ESP32
An ESP32 board provides Bluetooth connection between the F9P and the app

Internet connection

ZED-F9P Module

The ZED-F9P Module is a highly advanced Global Navigation Satellite System (GNSS) receiver designed for accurate positioning and navigation applications. It is equipped with a high-quality GNSS antenna that enables the module to receive signals from multiple satellite constellations, including GPS, GLONASS, Galileo, and BeiDou.
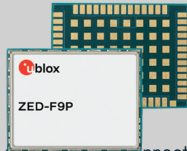
The module features I2C connectors, which allow for easy integration with other electronic components, making it ideal for use in a wide range of scientific applications, such as robotics, autonomous vehicles, and precision agriculture. Its compact size and low power consumption make it easy to install and operate in remote or harsh environments.

Android app

The Android app is a multifunctional controller that connects to our hardware and APIs. It uses Bluetooth to connect to the F9P Module and transmit high-precision RTK coordinates that replace the smartphone's default GPS coordinates. The app also captures 360° photos and assigns them coordinates based on the RTK coordinates. Finally, it uploads the images to Mapillary, enabling seamless data processing and further analysis.

Mapillary API

The Mapillary API is a tool that extracts cartographic data from georeferenced 360-degree images. It uses computer vision and machine learning algorithms to identify features such as road markings, traffic signs, and building facades. It can also detect changes in the environment over time, making it useful for monitoring urban development and assessing natural disasters. The API provides tools for working with cartographic data, including geospatial analysis, visualization, and machine learning.

WIFI connection

Centipede RTK

The Centipede RTK Network is a real-time kinematic (RTK) network that provides highly accurate positioning data for a range of applications. The network consists of strategically located permanent GNSS base stations that provide correction data to rovers - mobile devices that receive data from the base stations and use it to precisely determine their location in real-time (to the centimeter). This allows for accurate positioning for a variety of applications, from precision agriculture to surveying and construction.

360° Camera

The Ricoh Theta SC is a 360-degree camera that can be a useful tool for cartographic use. It can capture high-quality images of an environment, providing a detailed view of the surrounding area. With its compact size and portability, the Theta SC can be easily carried to different locations, making it a convenient tool for capturing images of various landscapes and terrains. The 360-degree images captured by the Theta SC can be geotagged, allowing them to be precisely located on a map. This can be particularly useful in cartographic applications, where accurate location data is essential for creating detailed maps

A bit more about our project...

Our project aims to develop an embedded system that can capture 360° photos with centimeter-level precision and upload them to software to create a Street View. We have incorporated an F9P RTK module in our system to achieve this level of accuracy. Additionally, we have created an Android app that connects to the F9P module and a 360° camera, allowing us to capture and precisely geo-locate the images. The images are then sent to Mapillary, a service that enables online map and Street View contributions by users.

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RTK Project