OPENSTREETMAP GHANA TRAINING

QGIS Plugin Development with Python

Introduction to QGIS Plugins

Jubílio Maússe
Senior Data and GIS Analyst | Geospatial Data Scientist

21 August 2026 | 16:00 GMT | 18:00 CAT

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OpenStreetMap Ghana Training



Introduction to QGIS Plugin Development with Python

Learn how QGIS plugins can automate workflows and support spatial visualization and decision-making.

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What is a QGIS Plugin?

Definition

A QGIS plugin is an extension that adds specific functionalities to QGIS, enabling task automation, integration of new tools, and solving operational problems.

Why Develop Plugins?

- **Automation:** Convert repetitive manual processes
- **Integration:** Connect QGIS with other platforms (KoboToolbox, APIs)
- **Specialization:** Create tools for specific field needs
- **Sharing:** Publish to the official repository for the community

Training tip: Think in terms of operational problems first, and software features second.

Plugin Structure

Essential Files

```
my_plugin/
|-- __init__.py
|-- metadata.txt
|-- plugin.py
|-- dialog.py
|-- resources.py
|-- icon.png
|-- README.md
‘-- LICENSE
```

What Each File Does

- `metadata.txt`: Name, version, author
- `__init__.py`: Plugin entry point
- `plugin.py`: Main logic and interface
- `dialog.py`: Windows and widgets
- `resources.py`: Compiled icons

metadata.txt: The Plugin Heart

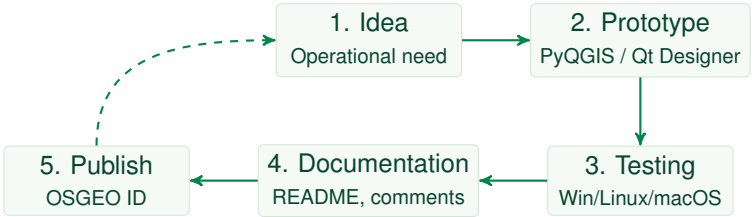
Example metadata.txt

```
[general]
name=GPX Batch Converter
version=1.2.2
qgisMinimumVersion=3.28
qgisMaximumVersion=4.99
supportsQt6=True
description=Batch-converts GPX
author=Jubilio Mausse
tracker=https://github.com/...
repository=https://github.com/...
license=GPL-2.0-or-later
category=Vector
icon=icon.png
```

Important Fields

- **qgisMinimumVersion**: 3.28+
- **supportsQt6**: QGIS 4+ / Qt 6
- **tracker**: Issue tracker
- **repository**: Public code
- **license**: GPLv2+ compatible
- **category**: Vector/Raster/Web

Plugin Development Cycle



Plugin Repository
https://plugins.qgis.org/

Requires OSGEO ID

Best Practices and Recommendations

Code Quality

- PEP8 and PyQGIS guidelines
- Comments in English
- Use `QgsTask` for background
- `QgsNetworkAccessManager`
- Native widgets

Publication

- No compiled binaries
- Size < 25MB
- README.md and LICENSE
- Provide test data
- Clear documentation

Complete Manual: QGIS Plugin Development with Python
https://jubilio.github.io/qgis-plugin-development-manual/

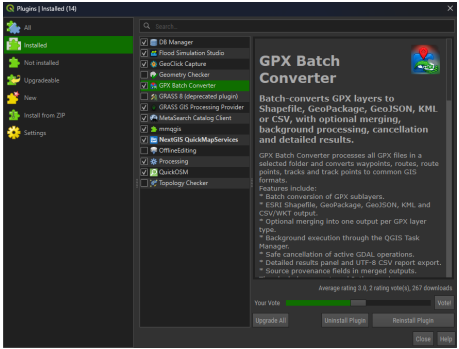
Case Study 1: GPX Batch Converter

The Problem

Field teams return with hundreds of GPX files. How to convert and merge them efficiently?

The Solution

- Batch conversion to Shapefile, GeoPackage, GeoJSON, KML, CSV
- **Merge Mode:** Merges all into one layer
- **Background:** Runs via `QgsTask`
- **Results:** Detailed panel and CSV report



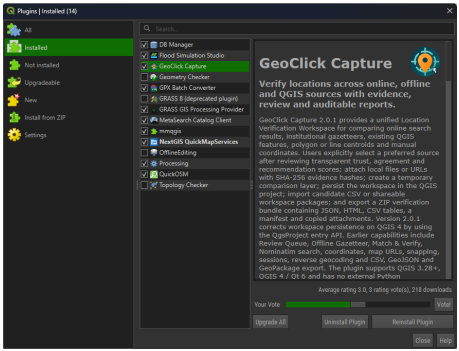
Case Study 2: GeoClick Capture

The Problem

Verifying a location from multiple sources is time-consuming and hard to audit.

The Solution

- **Unified workspace** to compare sources
- Sources: Nominatim, CSV, QGIS layers
- Calculates consensus and recommendation
- **Audit Trail:** Exports bundle
- **Tools:** Capture Log, Search, Match



Downloads: 218

Rating: 3.0/5.0

Plugin Comparison

Feature	GPX Batch Converter	GeoClick Capture
Primary Goal	GPS conversion & merging	Location verification
Main Input	Multiple GPX files	Single location to verify
Key Output	GIS files (Shapefile, GPKG)	Audit bundle (JSON/HTML)
Workflow	Batch processing	Step-by-step comparison
Complexity	Low-Medium	High (scoring, auditing)
Best For	Field data consolidation	Location validation

Installation & Compatibility

How to Install

Both plugins are available directly in QGIS:

1. Open QGIS
2. Go to **Plugins** → **Manage and Install Plugins**
3. Search for **GPX Batch Converter** or **GeoClick Capture**
4. Click **Install Plugin**

Compatibility

- QGIS **3.28** to **4.x** & Qt **5** and **6**
- Windows, Linux, macOS & No external dependencies

Manual: QGIS Plugin Development with Python

What You'll Find

- From basics to advanced PyQGIS
- Qt Designer interfaces
- Background tasks (`QgsTask`)
- Snapping, geocoding, networking
- Testing and Qt 5/6 compatibility
- Professional publishing

Case Studies

The plugins presented are used as examples:

- **GPX Batch Converter**
- **GeoClick Capture**

Access the Manual
https://jubilio.github.io/qgis-plugin-development-manual/

OpenStreetMap Ghana

www.osmghana.org

SPEAKER PROFILE

Jubílio serves as a Senior Data and GIS Officer and **Geospatial Data Scientist** based in **Mozambique**, specializing in Geographic Information Science. His professional expertise encompasses geospatial analysis, data management, humanitarian information management, remote sensing, and applied software development. He possesses practical experience utilizing **QGIS**, **Python**, **R**, **Google Earth Engine, KoboToolbox**, and other geospatial technologies to formulate data-driven solutions for tangible challenges. Furthermore, he develops QGIS plugins and GIS tools designed to automate repetitive workflows, enhance data quality, and increase the efficiency and accessibility of geospatial processes.



Jubílio Maússe

Speaker

Introduction to QGIS Plugins

https://tiny.cc/OSMGHtraining

21-Aug-26 | 04:00 pm GMT | 06:00pm CAT

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Thank You!

Questions?

Useful Links

- **Manual:**
  qgis-plugin-development-manual
- **GPX Batch Converter:**
  github.com/Jubilio/gpx-batch-converter
- **GeoClick Capture:**
  github.com/Jubilio/qgis-latlon
- **Plugin Repository:**
  plugins.qgis.org

Connect with Me

- **LinkedIn:**
  Jubílio Maússe
- **YouTube:**
  Deep Geo Programming
- **GitHub:**
  Jubilio