Development of open-access e-learning material for GIS education

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Abstract

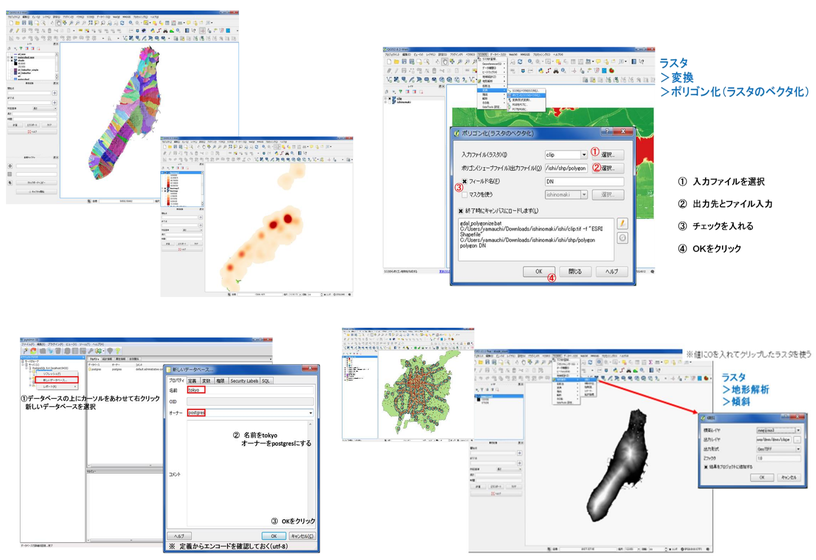
Many projects related to GIS education have been conducted in Japan. As a result, a basic core curriculum and teaching materials for university lectures were developed. However, materials usable for GIS practice courses in universities have been limited, although education of practice is necessary to provide human resources for future development of GIS. Therefore, we launched a project "Development of Open-access E-learning Material for GIS Education Based on the Existing Core Curriculum and the Body of Knowledge". The purpose of this project is to develop GIS learning materials for practical classes of university departments and graduate schools.

This poster presents the background and current situation of the project. Materials to be developed by this project support GIS-related 1) indoor use of software, 2) field surveys, and 3) utilization of the internet. Materials to learn the indoor use of GIS software concern basic operations of free GIS software such as QGIS. Materials to learn field survey methods related to GIS include videos showing the operation of equipment such as UAV. Materials for utilizing the internet include the creation and publication of GIS data using WEB GIS.

These learning materials are provided in the form of PowerPoint files and Markdown files with easy-to-understand descriptions. They will be published in the GitHub platform to obtain supports from users particularly to update the learning materials to efficiently deal with a version-up of software. After the materials are improved, they will be open to the public for e-learning of various people including students and civilians.

Use of software

- Materials for learning basic operations of GIS software are being produced.
- Students can learn mapping and spatial analysis using GIS.
- The materials are based on the GIS core curriculum and utilize free GIS software such as QGIS.



Prototype of use of software materials

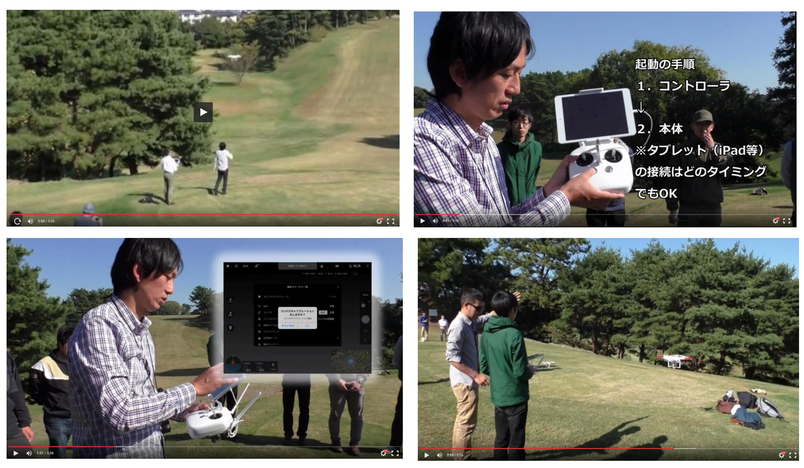
List of major sections

- Remote sensing and analysis
- Useable map data and attribute data
- Spatial data conversion
- Spatial database
- Marge and correction of spatial data
- Basic spatial analysis
- Network analysis
- Region analysis
- Point data analysis
- Raster data analysis

Vector →QGIS
Raster data→GRASS
Geo database→PostGIS
Remote sensing
→ MultiSpec

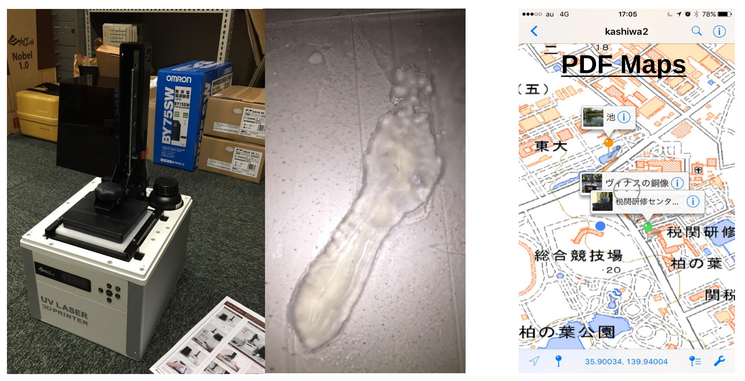
Educational videos

- Field surveys related to GIS sometimes require specific or expensive equipment.
- Therefore, videos introducing equipment with text guides are being produced.



Video to learn applications of UAV
（JGU School of Autumn 2015）

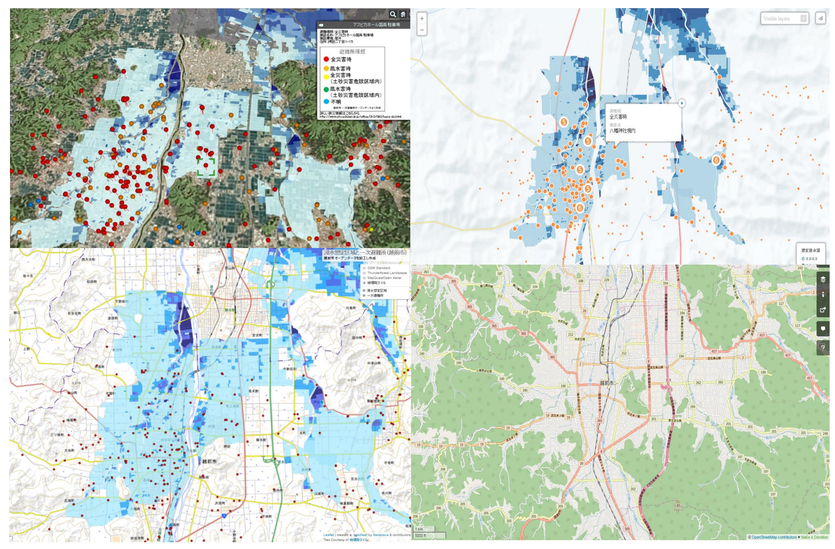
- The videos will deal with UAV, GPS loggers, surveying instruments such as total stations, 3D printers and tablet terminals.



Various devices for GIS applications
(3D printer and tablet terminal)

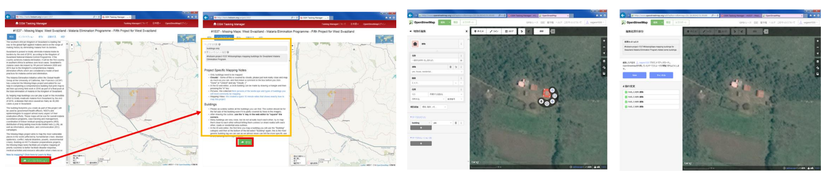
Utilization of internet

- Materials for learning Web GIS are also being created.
- Students can learn how to publish and visualize of GIS data on the Internet.
- Gh-pages, a GitHub function, the GSI (Geospatial Information Authority of Japan) map tiles, and open data are actively used in the materials.



Prototype of WEB GIS materials

- Script libraries and engines such as LeafLet, Cesium, Carto, GSIMap and OpenStreetMap are utilized.



OSM crisis mapping

- Volunteer mapping pro-jects such as crisis mapping are introduce in the materials.

Publish in GitHub platform

- The materials are published using the GitHub platform.
- Administration and updating of materials depend on the GitHub functions of "Pull Request" and "Issue".
- File types of the materials are PowerPoint and Markdown. Anybody can download and edit the materials.

Prototype of education materials and the web site.

Future work

- The materials will be published with a license that permits the access of anybody, such as © GIS Open Educational Contents WG and CC BY-SA 4.0.
- More advanced materials to learn advanced statistical analyses such as spatial autocorrelation, and spatial interpolation.
- The materials on the GitHub platform will be imported to the GitBook platform.
- We will also organize symposia and workshops for GIS education.