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Contents of Terms of Use on GSI's base map and other data

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Recently there have been many demands for using Geospatial Information Authority of Japan (GSI)'s background map data without Digital Japan Web System, because of remarkable change of technical condition induced by the development of communication tools and devices. Therefore, GSI developed the terms of use on GSI's background map data and published it on the Digital Japan Portal site (http://portal.cyberjapan.jp) on 6 October 2011. In this poster presentation We will explain the contents of the terms.

Keywords: terms of use, Digital Japan Basic Map (Map Information), Digital Japan Web System

Geovisualization of Endemic Malaria in Sakishima Islands in the First Half of the 20th Century: A Case of the Miyako Isl

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In Sakishima islands in the first half of the 20th century, 1,000 to 2,000 malarial patients were reported in every year. According to the old research findings, there was much endemic malaria in Sakishima islands in the island of continentality or volcanic island, and it was distributed over the area where there is a vertical interval of land and the basin system network progressed.

This research restored the geographical environment of endemic malaria in Sakishima island in the first half of the 20th century combining high resolution DEM, an old topographic map, and historical records, and performed consideration from a viewpoint of landform, land use and a settlement form. We studied the Higashi-Nakasonesoe of the Miyako Island. The Miyako Island is almost covered by the elevated limestone, but the study area is covered in the soil of mudstone, and is affected by the cliff made of fault.

Keywords: Sakishima islands, Endemic Malaria, Geographical Environment, Geovizualization

Detection and mapping of hot/cold spots of urban spatial change in Tokyo 23 wards

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After the collapse of the bubble economy at the beginning of the 1990s, the deregulation policies of the government promoted urban development in Tokyo Metropolitan Area. This activated real estate market and accelerated population recovery in downtown Tokyo. However, this trend was not observed equally but expanded spatial differentiation within Tokyo Metropolitan Area. Hirayama (2005, 2006, 2011) pointed out that the government policy to promote housing supply and urban redevelopment has split the urban space into "hot spot" of newly invested and redeveloped districts and "cold spot" of stagnated and depopulated districts. The aim of this study was to identify and map these districts by employing spatial analysis with GIS. Results of the local analysis of spatial autocorrelation based on the grid square statistics of the Population Census and Establishment and Enterprise Census revealed that hot spot and cold spot coexist within Tokyo 23 wards and the spatial distribution has changed.

Keywords: geographic information systems, grid square statistics, spatial analysis, map, Tokyo

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Designing Stories within Mappings for Enhancing Real World Experience

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1. Human knowledge transmit and acquisition - map and story

Humans gain experience and knowledge from the real world as well as from each other. People use various vehicles for conveying information to others, such as stories, maps, slideshows, interactive visualizations, and so on. People gain new knowledge from these media, at the base of connecting to their existing knowledge, experience and current circumstance. The new knowledge will enhance their behaviors and relationships with the society and natural world.

Story is made of a sequence of events. The events in one story are usually not isolated. There must be some relations between those events, which make them easier to be understood. These relations are varies, e.g. spatial, temporal, causal ones and so on, and are as important as the events in a story. Story is a comfortable way of acquiring knowledge, because within these relations we extend our knowledge step by step continuously.

Map is an important and useful vehicle for conveying spatial related information. However, conventional maps are not efficient in learning knowledge from them by ordinary people who are not well trained to read maps. These maps are usually too large sets of static symbols. This kind of maps is not efficient to be used and applied to our daily life. One reason is that they have weak relations with people's existing knowledge and within the symbols in the maps.

ICT gives us much more possibilities to make more friendly maps that are called mappings. Now the mappings are to be dynamic, animated with multiple scales, and to be linked with texts, pictures, videos and so on. As the result, the mappings can provide much more information and are easy to access by ordinary people, but the existing web mappings still have same weak points as conventional maps, when we consider them as vehicles to convey knowledge.

2. Event patterns of story within mappings

What we want to have is a mapping closer to the human nature of acquiring knowledge that can be used more directly to enhance our behaviors. In order of this, we give more concern about the relationships within the map symbols and items, and make them a sequence, which is more like the structure of a story. We may call it mapping with story.

We want to provide basic event patterns and several important issues for the new type of mapping.
- Point event: place of interest or importance (e.g. start, goal, intersection, folk point), which can include or connect to texts, pictures, audios, videos, and so on to introduce related information. A nest of points as well as lines can represent a relatively large and enclosing place, and can be abstract to a point in small-scale views.
- Line event: a way to move alone, from point to point, which can contain introductions of the relations (e.g. guidance). Lines and points are the very basic elements of a story in map.
- Stage: parts of a long story, which are relatively complete, connect to other stages with starting and ending point events. Stages in one story may not be in the same scale.

In these design patterns, the relations and connections are explicit also implicit. The explicit relations, like lines, are obvious to the users, but there are implicit connections such as those between a point and its related contents, between connected stages, and between users' current status and stories within maps. Actually, these are weak points of a paper guidebook. For making these implicit connections more obvious to the users, more dynamic graphic, interactive symbols and animations must be applied.

In using mappings with enhancing story, we are going to realize some implementations on mobile devices. Our proposed framework makes users acquire new knowledge more efficiently and comfortably from the mappings, with which they can get better experience of the real world.

Keywords: story, ubiquitous mapping, affordance, weak and strong relations

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For the diffusion of map literacy, let's use maps in school more.

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Maps are widely used as digital contents recently. The progress of the ubiquitous mapping technology gives us a lot of convenience. In such era, the importance of the acquirement of map literacy is getting bigger. It is desirable that people have a lot of chances to see and use maps from their childhood and get map literacy well.

Japanese children learn maps mainly in the class of geography field of the school subject "social studies" in elementary school and junior high school, and "geography" in high school. The systematic map studies are suitable to be done in the geography class, the usage of maps, however, is not be, and should not be, limited in the geography class. It is of great value to use maps in any activities other than geography class in school life.

There are two problems for the promotion of map usage in schools:
1) Large part of school teachers have had no (or very little) cartography education in universities, and they are not familiar with maps.
2) Even though a teacher has rich knowledge of cartography, he/she does not know how to use maps well in various school life as well as in geography class. There is no guidebook for such teachers.

The "JCA (Japan Cartographers Association) -JMC (Japan Map Center) Joint Working Group on the Promotion of Map Usage in Schools" started its activity in 2008 for the improvement such situation. Since then, the members of the WG have collected actual examples and ideas of good map usage in schools, and edited short articles each of which shows an individual case written by the WG members and teachers. The articles were serialized from April, 2009 to March, 2011 in the monthly magazine *Chizu Chushin* published by JMC.

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Development of GeoPack, The Software Tool for Higher Education of Geospatial Information Technology

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1. Introduction

The Japanese Government encourages the dissemination of Geographic Information Systems (GIS) for the people by enact of the basic low on the promotion of application of Geospatial Information in 2007. We can easily reuse and exchange geographic information, if it is in compliance with the industrial standards. The Japanese government assigns technical standards in the basic plan provided under the low in order to realize such a situation. However, the knowledge such as Object Oriented Modeling, UML and XML are the basic knowledge of Geographic Information Standards, and the user must understand them before utilize the standards.

Meanwhile, the author had got the opportunity to teach the half year course of the Introduction to Geographic Information Technology three years in the University of Tokyo, and was the member of the research project on the design of university curriculum for GIS education since 2007 to 2009. These experiences are the motivation to develop the software tool for GIS education.

2. GeoPack, Its Aim and Characteristics

The name of software tool is GeoPack. The aim of the developing GeoPack is that the student can learn not only the fundamental knowledge of GI-technology but also how to develop GIS. The student may experience the GI knowledge through using GeoPack and the software explain how to use and how to realize the functions in GeoPack.

3. The Functions of GeoPack

The Body of Knowledge for GI Technology consists of modeling, acquisition, management, analysis, exchange and representation. Application schemas can be designed at the modeling window. Feature instances and their multimedia attributes can be acquired on the acquisition manager window. The student can input metadata of the spatial data file and get a file using metadata on the management window. Fundamental spatial analysis can be run on the analysis window. User readable XML documents are provided by using exchange function on the exchange window. Finally, symbol style design and map representation are possible on the representation window. The student can learn the knowledge by reading the manual, description and source program provided through each window.

4. The Future Work

Most of functions are already developed. However implementation of temporal attributes, coordinate operations, map representation in compliance with the symbol style definition are still under construction. And we must brash-up the manual and descriptions. We have a plan to complete the development until the end of 2013.

5. Acknowledgment

References

[1] Ota, M., Arikawa, M., A Curriculum for Geospatial Information Technology and Its Experimental Practice, Proceedings of 6th International Symposium on Digital Earth, Beijing, China, Sept., 9-12, 2009

[2] Ota, M., Basic Schema on The Geographic Information Developed for Higher Education, Proceedings of Digital Earth Summit, Nessebar, Bulgaria, June, 12-14, 2010

Keywords: geospatial information technology, geographic information standards, higher education
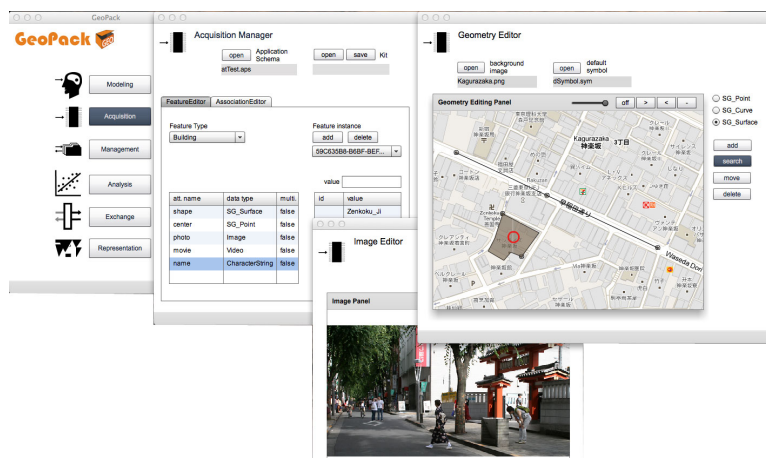
Implementation for Mobile Place-Related Content of Maps and Audios with Storyboard

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1. Backgrounds and Problems

Digital Map Services are getting popular among not only science research, but also our daily life. People think that these services are useful for viewing and recording simple place-related information includes photos and descriptions. Common digital map services, however, have following main two problems. Firstly, users' photos and descriptions of maps are connected with only points of interest. It is often fragmentary and monotonous information. In addition, these photos and descriptions do not contain sequential stories and place-related guidance. Secondly, when users walk outdoors with content of mobile digital maps, they sometimes struggle to find their ways and they always have to gaze a map for acquiring place-related information. It is not suitable for outdoors users to achieve smoothly travel and gain rich stories about places.

2. Purposes and Methods
2.1. Audio Tours with Mobile maPodWalk Caster

In our research, to solve the two main problems, we have implemented a new mobile application named Mobile maPodWalk Caster. It records and displays maps and audio tours with human narrations. These narrations are synchronized and visualized with tours' route. Users view and listen to the location-based audio tours by controlling a timeline and a map interface of Mobile maPodWalk Caster. With walking along content's route, users can easily check if they get lost their ways by watching a map with the user's current position and a photo related with the current place and by listening to an audio playback for getting information of places,. Mobile maPodWalk Caster has common digital map functions such as displaying maps, changing scale of maps, providing current positions using GPS, showing direction with a digital compass. We call the representation of mappings with freely changing its spatial extent geocentric mapping mode on the service. On the other hand, the representation of mappings with displaying the current position of the user at the center of a screen is called egocentric mapping mode. The mode allows a user to obtain right information easily from the sreen of the device. Another useful feature of Mobile maPodWalk Caster is the function of importing and displaying user made and selected background maps such as illustration maps and maps of guidebooks.

2.2. Storyboard of Moile maPodWalk Caster

We introduce a significant function named storyboard for enhancing capability of representing place-related content. The storyboard provides sets of visual animation effects with photo slides, short texts and visual arrows related with directions of subjects. These visual effects are managed with a list of storyline and displayed on time and positions of the audio tours.

3. Conclusions

People are familiar with audio content such as radio and music. They, however, did not have methods to relate audio content with paper maps. With maPodWalk, people can have a confortable environiroment to easily gain the information from audio and maps with mobile devices. In addition, functions of storyboard and user made background maps of maPodWalk enable enhanced capability for cartography and spatial recognize. We are going to prove that the framework of maPodWalk is useful for not only recording place-related information, but also digital education and digital storytelling purpose.

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Audio Tour with Geocentric Map   Egocentric Map with Text Animation

Fig. Screenshots of maPodWalk Caster with iPhone

Map Images: ZENRIN Co. Ltd

Global Map tells us the situation of the world

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Global Map is a basic global geospatial dataset developed through the international cooperation of the national mapping organizations in the world. It consists of eight thematic layers based on the consistent specifications. By combining the Global Map with other useful geospatial information, we can understand the human activities which affects the environment and the current situation of land cover or tree cover. This presentation will introduce the Global Map and the current situation of the world seen through the Global Map.

Keywords: Global Map, Geospatial Information, Global Environment, Land Cover, Percent Tree Cover

Distribution of Earth Scientific Information estimated using RK and Display by Google Earth

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RK, Regression Kriging, is one of the spatial statistical method for estimating some distribution from the discrete spatial sampled dataset about the research field. RK uses the kriging method (Matheron, 1973) with some auxiliary map to minimize the estimated error. The RK procedure was performed by the R-Language (Ihaka and Gentleman, 1996) using some geostatistical libraries. The auxiliary maps required by RK were prepared by the authors with some GIS applications. The 3-dimensional geographic representations for the estimated distribution were performed by the Google Earth (Google, 2011).

Keywords: Ordinary Kriging, Regression Kriging, Auxiliary maps, R-Language, Google Earth

Hazard map for the better awareness of disaster

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In Japan, every local government made several sorts of hazard maps and they are distributed to the residents. After the Great East Japan Earthquake, people are much concerned about the prevention of disaster. But the people don't become to use the hazard maps and people tend not to get the information of their residential area's geomorphological condition. The objective evaluation of the residential area against disaster causes effective evacuation on the disaster. It is important to improve the hazard perception about their residential area.

The aim of the study is to clarify the structure of the conscious of disaster in the people on the sever area of the floods in Toyama city.

People are concerned with the disaster prevention activity but they don't try to grasp the geomorphological condition in their resident area. It is efficient to use the past topographical maps to improve the situation. The past land use information is understandable to the people to recognize the hazard situation their residential area. DIG (Disaster Imagination Game) with hazard map is also effective activity to improve the consciousness.

Keywords: hazard perception, hazard map, topographical map, DIG