NEW TECHNIQUE OF REMOTE SENSING IN THE UNIVERSITY OF ARCHITECTURE & PLANNING

Ruoming Shi Min Xu Ling Zhu

Beijing University of Civil Engineering and Architecture

1. OVERVIEW

Since remote sensing technique is developing rapidly, demands for different applications are increasing. Recently, improvement and combination with other techniques of remote sensing technique are used to solve problems and offer effective services in some profession fields, except the traditional ones such as geology, agriculture, geography, surveying, mineral & forest resources and weather & irrigation services. Conception of digital earth and project of cyber city are built to enhance the informationization, so that new techniques including high-resolution satellite image, terrain laser scanning and 3S integration are becoming general or primary assistant applications. In order to strengthen and promote the use of these techniques scientifically and effectively, it is extraordinary necessary for students in universities of architecture & planning to setup relevant courses and programs for a variety of academe and engineering education to meet their needs.

2. CHARACTERISTIC SETTINGS OF PROGRAMS AND COURSES

2.1. Program Settings

At present more than 140 universities and colleagues have courses related to RS techniques, but each of them is different in educating directions and most of them are integrative universities. Since the RS courses are found more in specialties of agriculture and forest, survey, mineral resource, traffic and pedagogy, it is necessary to setup RS courses to meet the needs for constructions and managements of cyber cities.

Beijing University of Civil Engineering and Architecture (BUCEA) is a typical university specialized in architecture programming and city planning. The department of urban spatial information has majors programs: Survey Engineering of Architecture, GIS Engineering of Urban and Digital Simulating of Architecture, and gives RS technique courses in application for city planning and management.

This paper analyses the advantages of our course settings and introduces the teaching contents and practice methods based on our particular process in settings of undergraduate courses and training courses.

2.2. Aims and Contents of Teaching

BUCEA is a university specialized in architecture programming and city planning, relies on ascendant specialties including architecture, urban planning, construction and traffic engineering and others. Main teaching aim is facing to services for urban planning, construction and management with modern RS techniques. It is also aiming at teaching and training of terrain laser scanning for ancient architectures, of mapping mobile system (MMS) and GPS for management of city roadways and establishments, of high-resolution satellite image processing and GIS for urban planning and dynamic monitoring of urban landuse. It is our characteristic and superiority in development of RS teaching and training to associate planning and management of urban architecture and RS techniques.

2.3. Course Settings

RS courses of Planning and management of urban architecture specialty including three sections: theory, technique and practicum, as proportion 3:4:3. Theory part consists of RS physics basic, RS geography basic and RS mathematics basic, but the section gets less contents and proportion than traditional RS courses settings. Technique part consists of digital image processing, photogrammetry, digital 3D modeling and application, GPS and GIS, and it gets more contents and proportion than traditional RS courses settings obviously. As a result, the setting has the combination of RS techniques and others, and also gives prominence to the growing applications of RS techniques in RS domain for constructions, planning and services of cyber city. Practicum part is another important section that also shows our teaching characteristic. Three practice training plans on RS techniques applications in planning and management of urban architectures are presented in the next chapter.

3. PRACTICUM TRAINING PLANS

3.1. Training Plan of Urban Land Using Monitoring Practicum

Practice training for urban GIS Engineering. This plan is to use high-accuracy satellite images for urban landuse monitoring in Beijing, including data processing, features identifying, spatial database building and thematic mapping.

3.2. Training Plan of Digital Ancient Architecture Protect Practicum

Practice training for digital simulating of architecture. This plan is to use terrain laser scanner for digital reconstruction of the Taihe Gate of the Imperial Palace, including 3D point clouds collecting, point clouds data processing, 3D model building based on point clouds and digital texture matching.

3.3. Training Plan of Management of Urban Roadways and Traffic Establishments Practicum

Practice training for construction engineering survey. This plan is to use MMS, GPS and GIS for surveying of traffic sign establishments on high streets in some district of Beijing, including multi-source data collecting, positioning, processing, spatial database building and system integrating.

4. CONCLUSION

Universities of architecture and planning depend on the improvement of RS new techniques aim at the settings and teaching of RS, bring up complex professionals with both theory of planning and management of urban architecture and technique of modern RS. For the sake of accommodating the constructing and development of cyber city, we take the advantages of traditional architecture planning, and extend the means and scopes of RS teaching, to establish the feature and predominance of combination of theory of planning and management of urban architecture and technique of modern RS.