#Jenny

Finally I get this ebook, thanks for all these I can get now!

#Rio

Cool! I'am really happy

#Markus Jensen

I did not think that this would work, my best friend showed me this website, and it does! I get my most wanted eBook

#Hun Tsu

wtf this great ebook for free?!

#Che Salsa

My friends are so mad that they do not know how I have all the high quality ebook which they do not!

#Diego Butler

so many fake sites. this is the first one which worked! Many thanks

ISSN 2321 – 9149 IJARSGG (2017) Vol.5, No.1, 1-18
Article
IROSSS International Journal of Advancement in Remote Sensing, GIS and Geography

REMOTE SENSING AND GIS FOR CIVIL ENGINEERING APPLICATIONS AND HUMAN DEVELOPMENT

Jeganathan[a*], C., Pramod Kumar[b], Kshama Gupta[b], Rahul D. Garg[c,d], Anand Kr. Sinha[c,e], Kirti Avisek[c,f], and Ramesh Hebbalu[b]

[a] Department of Remote Sensing, BIT, Mesra, Ranchi, Jharkhand.
[b] Department of Urban and Regional Studies, IIRS, ISRO, Dehradun, Uttarakhand.
[c] Department of Civil Engineering, IIT, Roorkee, Uttarakhand.
[d] Department of Civil and Environmental Engineering, BIT, Mesra, Ranchi, Jharkhand.
[e] State Institute of Urban Development, Mysore, Karnataka.
(* Corresponding Author: jeganshanc@bitmesra.ac.in)

1. INTRODUCTION: Civil Engineering is one of the oldest and important branches of engineering, comprises of many sub-divisions such as surveying (topographic/cadastral/matural resources etc.), construction (urban/rural/municipal infra-structure/materials etc.), transportation (roads/bridges/traffic etc.), water resources (water supply/treatment/ canals/dams/ storm/sewers etc.), environmental (chemical and biological waste/public-health/pollution-impact/remedy/resource management etc.), geological (rock, soil mechanics/ earthquake engineering etc.) and coastal (erosion/flood defense/hydro-dynamics etc.). In simple terms the civil engineering applications can be divided into two groups: a) human related b) environment related, and remote sensing plays a vital role in providing required near-real-time images/data about the ground/topography/weather/ landcover which will potentially help the civil engineers for effective planning and decision making (Fig. 1).

One of the basic requirements in civil engineering is ground investigation (i.e., survey). Classical land surveying in civil engineering refers to the process of determining position, distance, angle and height of buildings and terrestrial features. Surveying is an integral part of any developmental activity however technological advancements have brought key changes in the *survey process* and *quality of data*. Key benefits of remote sensing in surveying applications comes from three important developments: a) *advancements* in spatial, spectral and temporal resolutions (which helps in accurate detection, demarcation of objects/boundary and status/changes), b) *capability* to produce 3D stereo viewing (which helps in measuring heights of objects and terrain) and c) *availability* of advanced Geo-spatial algorithms and tools.

Surveying in a remote inaccessible areas and mountainous regions have posed great difficulty in the past and one has to invest lot of time for travel, man power and money. Fortunately, remote sensing technology has provided a possibility to see and survey those remote locations from the lab and to quantify all needed parameters of the terrain (such as height, slope, aspect, contours, watershed delineation, surface area, volume etc.) without actually going to field (See Tables 1 & 2 for details). Moreover, data are acquired today at various scales starting from sub-meter level (car, building, individual tree) to broader level (river/forest/geomorphological pattern) and hence providing a gold mine of data and information for surveyors. Apart from geometrical facts about ground features it is also important to have multi-scale database about land condition, its usage and geo-environmental interaction (i.e., drivers) so as to equip urban/environmental administrators for a better future planning and develop strategy for unforeseen calamity (such as fire, earthquake, flood, landslide etc.).

Aerial photo dependent Photogrammetric techniques were used in the past for extracting elevation of objects/ground, digital surface model (DSM), 3D city modelling, and close range photogrammetry techniques are being used recently for measuring 3D properties of buildings, monuments and quantify surface deformations [1][2]. Today, data from High spatial resolution satellites, LIDAR (Light Detection and Ranging device mounted on small aircraft) and UAV are more preferred for building inventory and city surveying [3][4][5] as it provides highly accurate elevation data (micro-contours), quickly reveals city geometry and helps to model climate change impact (e.g., flood scenario in a city) as well as contributes in establishing baseline maps for future studies. For example, Netherlands lies below mean sea level and hence they are prone to sea water intrusion and flooding. To ensure the safety of their citizen Dutch Government (Ministry of transport, public works and water management – Rijkswaterstaat) carry out regular LIDAR survey along their dikes to monitor water levels, health of groynes (structures of sand and stone), soil volume, deformations, wave characteristics etc.

Download PDF version of :

Remote Sensing And Gis Applications In Civil Engineering