Independent Section 3D Modelling Buildings with Procedural Modelling -

SEVKET BEDIROGLU
VOLKAN YILDIRIM
TAHSIN YOMRALIOGLU

CONTENTS

- WHY 3D, WHY INDEPENDENT SECTION?
- RULE BASED (PARAMETRIC) 3D MODELLING
- CASE STUDY-APPLICATION
- GIS BASED 3D MODELS OF INDEPENDENT SECTIONS
- MOVING 3D MODELS TO CLOUD GIS
- INTEGRATING INDOOR FEATURE 3D MODELS with INDEPENDENT SECTIONS ON CLOUD GIS
- CONCLUSIONS
WHY 3D, WHY INDEPENDENT SECTIONS?

3D is almost getting popular and essential because of bringing intelligibility to understand components of the our houses, cities, countries and our world.

Second reason is difficulty behind municipal and local managing properties rapid growth of population and decrease in suitable areas for relevant facilities.
Also there are to many important reasons for working in 3D
 Rule Based Modelling with City Engine

How System Works

1. Base Geometry

2. Procedural Rules

3. Generated 3D Model

Procedural 3D Modeling

- Source: URL 1
ADVANTAGES OF RULE BASED 3D MODELLING

✓ SYSTEM IS BASED on GIS so NON-SPATIAL DATA COMES INTEGRATION IS POSSIBLE

✓ SAVING TIME and BUDGET FOR LARGE PROJECTS (DISTRICT or CITY LEVEL)

✓ EASY UPDATE AND APPLY CHANGES ON MODELS WITH ELASTIC STRUCTURE

✓ MANY BUILDINGS CAN BE MODELED with JUST ONE RULE

✓ and also... CITY ENGINE IS AN EFFICIENT TOOL FOR MANAGING and DESIGNING URBAN CONTENT

AUTOMATION of GATHERING INDEPENDENT SECTION DATA FROM ARCHITECTURAL PLANS
AUTOMATION of GATHERING INDEPENDENT SECTION DATA FROM ARCHITECTURAL PLANS

• AT THIS PART WE DEVELOPED A NEW SYSTEM BASED ON PREVIOUS STUDIES FROM DIFFERENT SOURCES. WE INVESTIGATED VARIOUS SYSTEMS AND CONCENTRATED ON EFFICIENT and INEFFICIENT PARTS OF EACH SYSTEM.

• OUR METHOD IS COMMONLY BASED ON MANY IMAGE PROCESSING AND GIS METHODS. AT INITIAL PART, WE USE ArcMap, ARScan and Image processing algorithms for GEOREFERENCING and NOISE CLEANING FROM ARCHITECTURAL PLANS.

POSSIBLE USAGE AREAS of DEVELOPED SYSTEM in FUTURE

• Local Government
• Municipal Management
• Tourism Applications
• Tax Management

Source URLs: 2, 3, 4
CASE STUDY

STUDY AREA

Study Area - Trabzon, Turkey
TEXTURED BUILDINGS and 3D LAND SURFACE MODEL

INDEPENDENT SECTIONS
ATTRIBUTE QUERY of an INDEPENDENT SECTION on 3D MODEL

MOVING 3D MODELS to CLOUD (ARCGIS ONLINE)
INTERIOR INTEGRATION with AUTOCAD 360 CLOUD (Future Study)
CONCLUSIONS

- Results stated that using procedural modelling and CGA language is an efficient technique for the purposes of land administration and spatial data visualization. First steps of 3D modelling may be hard but after creating relevant CGA codes number of the buildings to model is not so important.

- Cloud computing is a helpful technology for interacting with citizens. By this way citizens can easily Access their estates, get information about it and change any wrong information if system support change and if it is relevant.

- Indoor model integration is one of the key challenging problems behind 3D city information systems. With this paper we have aimed to integrate interior models as few as details. We also plan to integrate these models with more details and their semantic relations.

References for some Figures taken from Internet

Url 1: https://www.slideshare.net/ufbobo/introduction-to-city-engine
Url 2: https://www.tes.com/lessons/jRN-ZGhRn_sMaQ/tourism-3a
Thanks for listening

KTU GISLab

E mail: sevketbediroglu@gmail.com