

CSCI 599 – Fall 2009

**Geospatial Information Management
Course Project**

Arc-GeoSIM

**Bei Pan (Penny)
Infolab
beipan@usc.edu**

National Science Foundation
Engineering Research Center

USC IMSC
Integrated Media Systems Center

Motivation

- When we take a picture from satellite:
 - Roof Picture




National Science Foundation
Engineering Research Center

USC IMSC
Integrated Media Systems Center

What is GeoSim?

- GeoSIM: Creating the environment texture through social participation of users equipped with camera phone



- Direct Users with GPS info
- Evaluate the pictures from Users
- Attach textures to the building geometry


National Science Foundation
Engineering Research Center

USC IMSC
Integrated Media Systems Center

What do we have?

- G1 Client:**
 - 1) View point selection
 - 2) User Management System
 - 3) Image taking guided by simulated images
- 3D Model Server:**
 - 1) Simulating Images for users
 - 2) Pictures Evaluation pipelines
 - 3) Building Texturing on offline models

Two levels of processing: online and offline

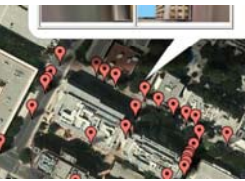


National Science Foundation
Engineering Research Center

USC IMSC
Integrated Media Systems Center

Is there missing something?

- User cannot browse the pictures
- User cannot query the pictures
- Current server model is developed under C#
- Need more online-ish model environment



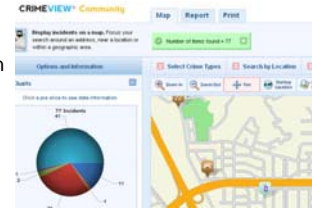
- Solution:**
 - Google Map API?

National Science Foundation
Engineering Research Center

USC IMSC
Integrated Media Systems Center

What is ArcGIS?

- ArcGIS is a suite consisting of a group of geographic information system (GIS) software products produced by ESRI.
 - ArcCatalog - Data
 - ArcToolbox - Analysis
 - ArcMap - Visualization
- ArcServer
- ArcScene



National Science Foundation
Engineering Research Center

USC IMSC
Integrated Media Systems Center


Supported Function (I)

- Online Visualization (2D)
 - User Moving Trajectory
 - Picture Browsing
- User-wised Query
 - Temporal Query
 - Spatial Query (NN query) [Paper A1]
 - Text Query (*)
- Geometry-wised Query
 - Range Query
 - User Trajectory Query
 - CkNN User Query [Paper B1 & B2]

National Science Foundation
Engineering Research Center USC IMSC
Integrated Media Systems Center

Supported Function (II)


- 3D visualization
 - Using 3D terrain data and ArcScene
 - e.g. buildings to be taken by the specific user
- Mobile Based Function (*)
 - ArcMobile
 - Do spatial query on the cell phone



National Science Foundation
Engineering Research Center USC IMSC
Integrated Media Systems Center

Supported Function (III*)

- Texture Mapping
 - Image Processing
 - Computer Graphics



National Science Foundation
Engineering Research Center USC IMSC
Integrated Media Systems Center

Implementation

- Data Availability:
 - USC DEM Data (Digital Elevation Model)
 - Geo Database support (geodb)
 - Image Database
- Software Availability
 - ArcGIS 9.0x (free license for course usage)
 - Visual Basic Application
- Human Source Availability
 - CSCI 599

National Science Foundation
Engineering Research Center USC IMSC
Integrated Media Systems Center

Task & Timeline (2~3 person)

- Sep:
 - Adjust the GeoSIM model into ArcGIS format
 - Setup the ArcServer and brief query interface
- Oct:
 - Finish the spatial query functions
 - Milestone Test : all the queries and 2D visualization
- Nov:
 - 3D model construction & Texturing
- Dec:
 - Final Report

National Science Foundation
Engineering Research Center USC IMSC
Integrated Media Systems Center

Reference

- GeoSIM
 - <http://infolab.usc.edu/projects/GeoSIM/>
- ArcGIS
 - Discription
 - <http://www.esri.com/software/arcgis/>
 - Sample
 - <http://sanbernardino.ca.crimeviewcommunity.com/>

National Science Foundation
Engineering Research Center USC IMSC
Integrated Media Systems Center