Site View Reconstruction for Urban Planning Using ArcGIS, Google Sketch up and Google Earth

A Case Study of the University of Nigeria Enugu Campus

Ndukwu, Raphael Ike
Department of Geoinformatics & Surveying
University of Nigeria, Enugu Campus.

Chigbu, Njike

Department of Surveying and Geoinformatics
Abia State Polytechnic Aba

Daberechi, Michael
Department of Geoinformatics & Surveying
University of Nigeria, Enugu Campus

Introduction

- **3D computer visualization of our world is becoming common place, appearing on the internet through popular map and geospatial information sites.**
- **Engineers and planners are becoming interested in the computer modeling of the environment to allow better visualization, greater understanding of the world, and for enhancing their decision making processes**
- **In urban planning domain advancement in computer technology and information technologies (I.T.) has contributed to the shaping of new trends in the process of urban planning (Johanna, 2008).**
- **Traditionally, urban planning involves the physical structure of development, generally following a master plan**

Introduction

- **However, when considering urban planning as a community decision- making process, participation and communication are fundamental to the process.**

- **Public participation in the decisions taken about the projects is many times insufficiently promoted and excludes some community groups (Innes and Booher, 2004, Kingston, *et al.*, 2000)**

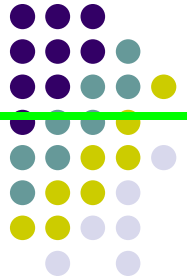
- **It is not uncommon that difficulties arise in understanding the urban environment and spatial relationships when plans are presented on 2-D maps or artists' impressions.**

- **Photo realistic 3D Scene reconstruction of an urban Scenario and visualization can enhance collaborative planning process by serving as a collaborative environment where users can actively take part in the decision-making process**

Problem Statement

- **Public participation in the decisions taken about Urban projects is many times insufficiently promoted and excludes some groups**
- **Difficulties in understanding the urban environment and spatial relationships when plans are presented on 2-D maps or artists' impressions.**
- **Cost and Complexity of reconstructing 3D Urban environment**
- **The solution is to reconstruct Photo realistic 3D model of an urban scenario**

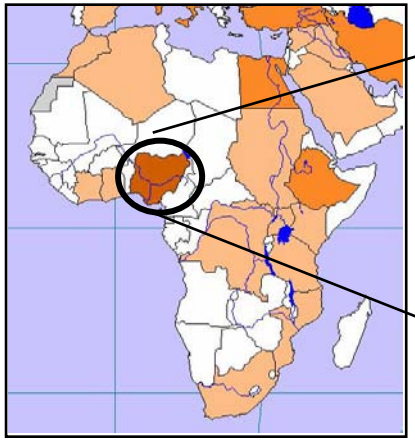
Objectives



- **To reconstruct photorealistic 3D model of an urban scenario or built environment using simple modeling tools**

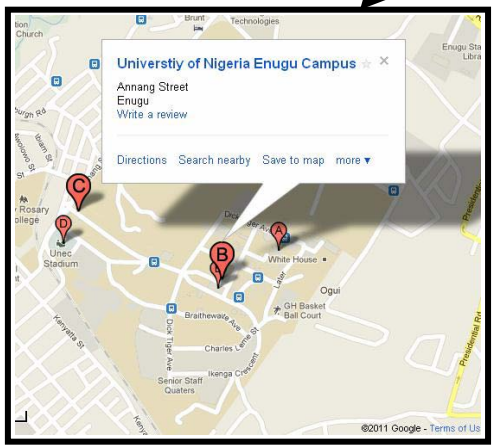
- **To visualize the model in a 3D environment such Google Earth**

Study Area



Map of Africa

Administrative map of Nigeria



University of Nigeria Enugu Campus in Google Map

Material and Methods

Materials

- ***Dataset used for modeling***

  - **Digitized 2.5D map of the study area .**
  - **Ikonos satellite image covering the study area.**
  - **Shuttle Rader Topographic Mission (SRTM).**
  - **Attribute dataset (height of building, Names ,elevation Values)**

Tools

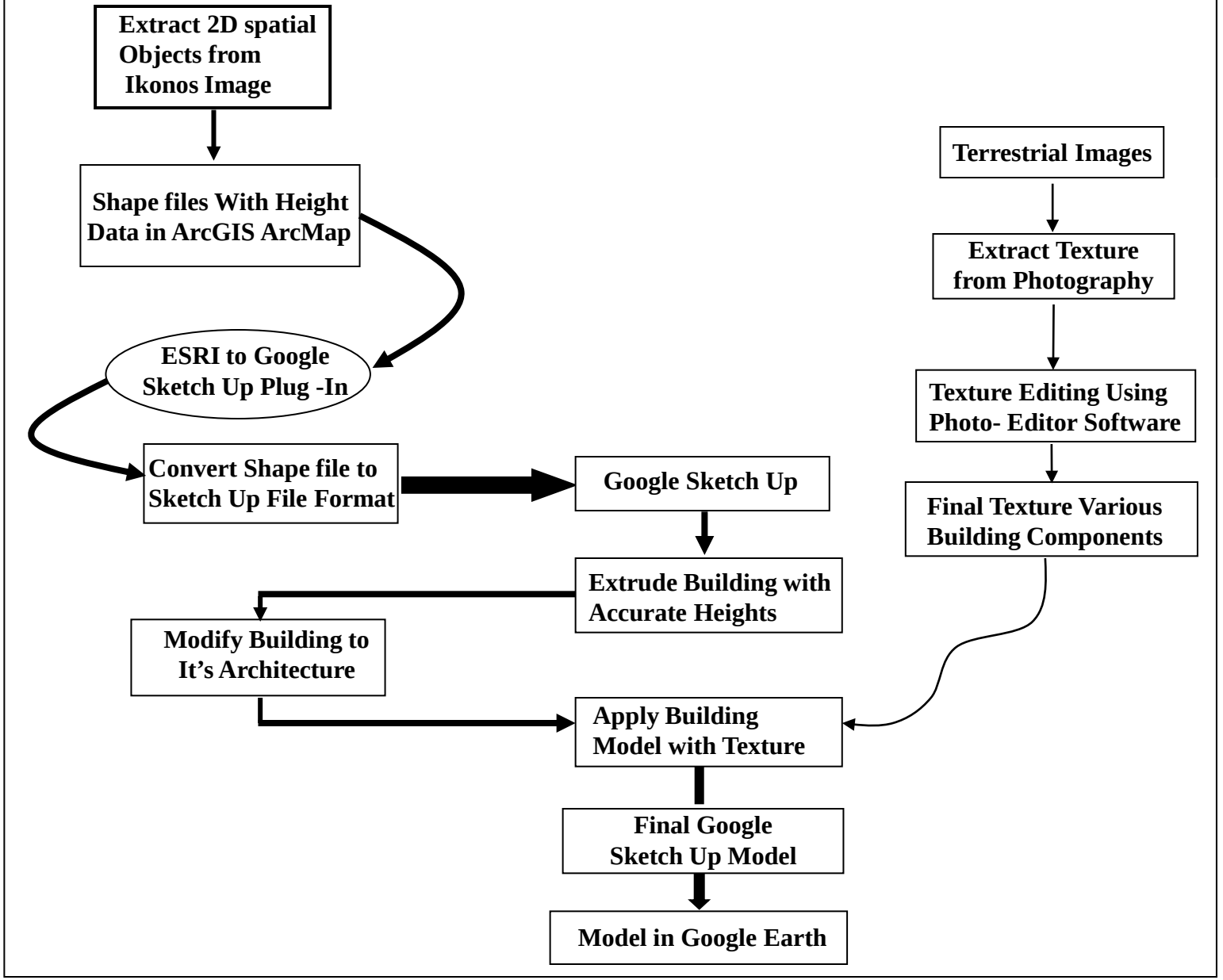
Hardware: HP Pavilion laptop with the following specifications

- **2 giga bytes RAM size)**
- **Core 2 Duo Intel processor of 2 giga bytes clock speed each**
- **150 giga bytes of hard drive**

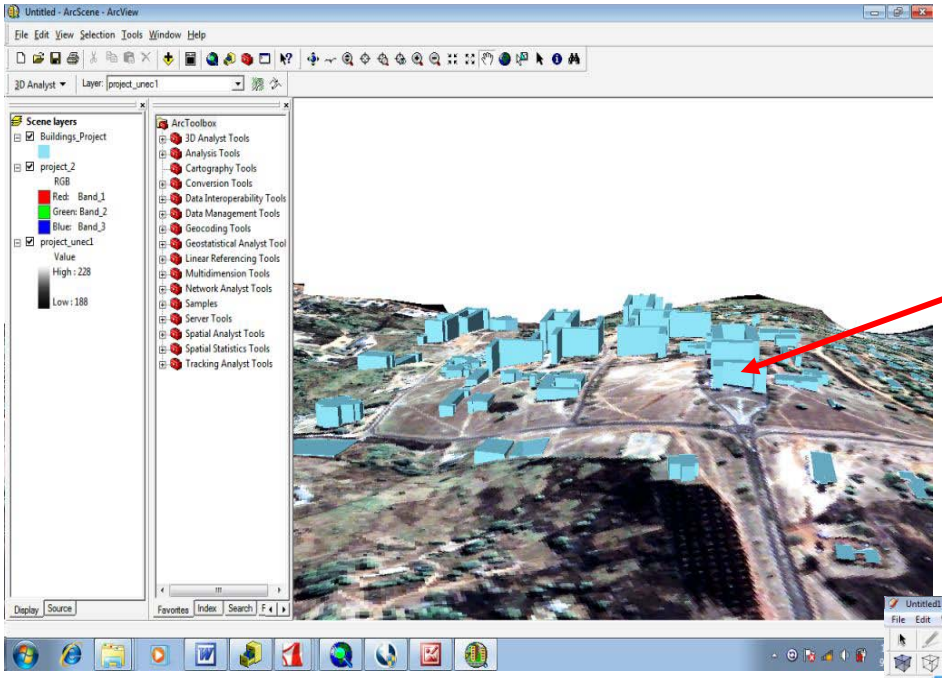
Software:

- **ArcGIS 9.2(GIS software)**
- **Google Sketch up 7.1(3D modeling/Authoring Software)**
- **Adobe Photoshop CS4**
- **Google Sketchup ESRI Plug-in**
- **Google Earth**

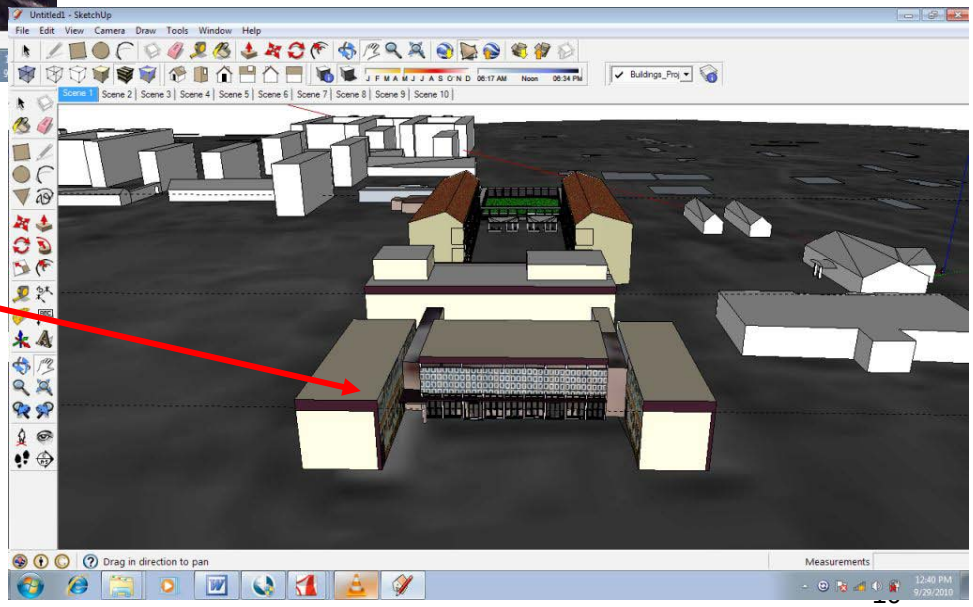
Methodology



Methodology

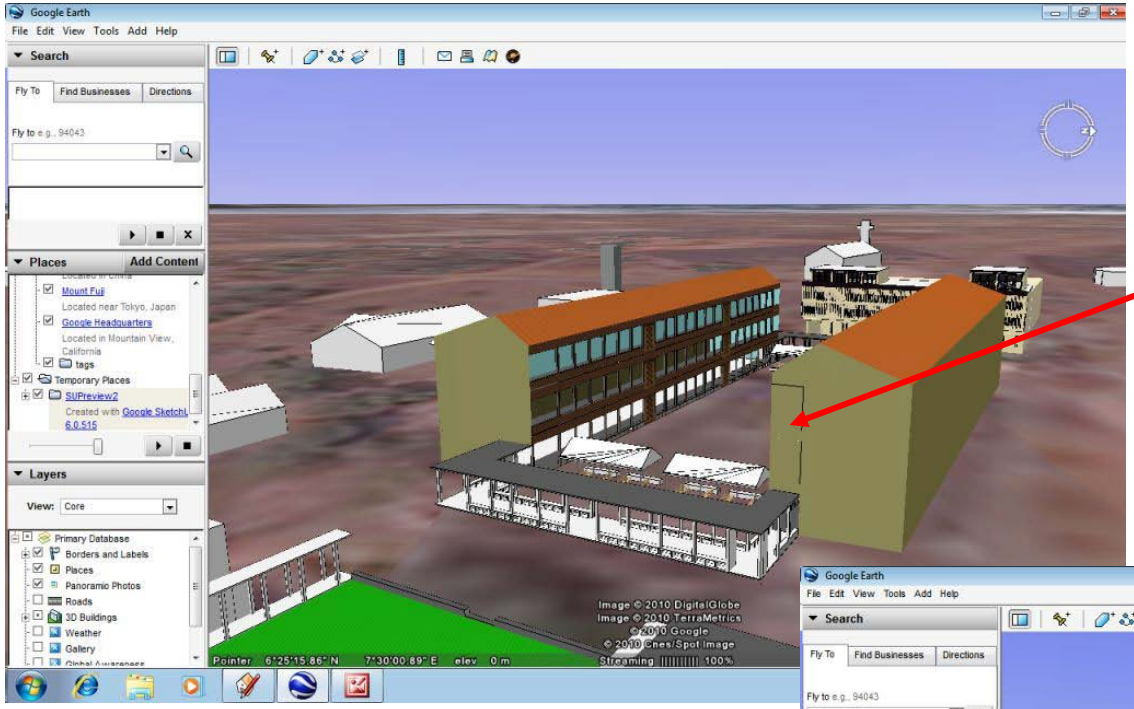


3D model of the study area in Arc Scene

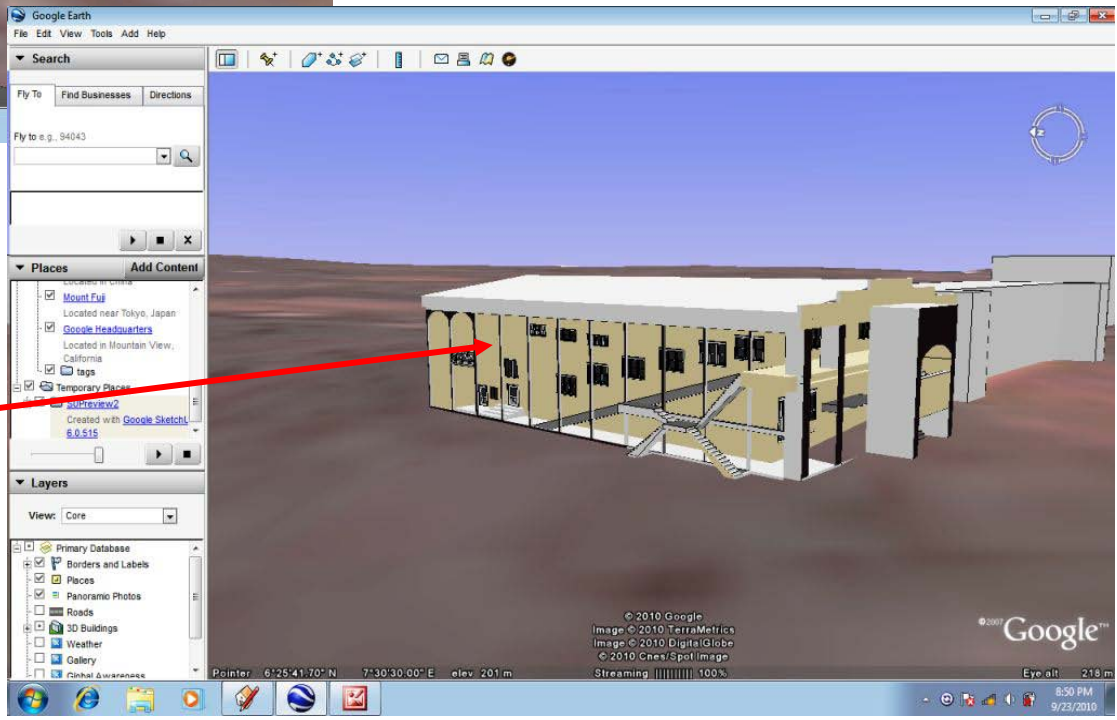


3D model of the study area in Google Sketch Up modeling or authoring Environment

Results

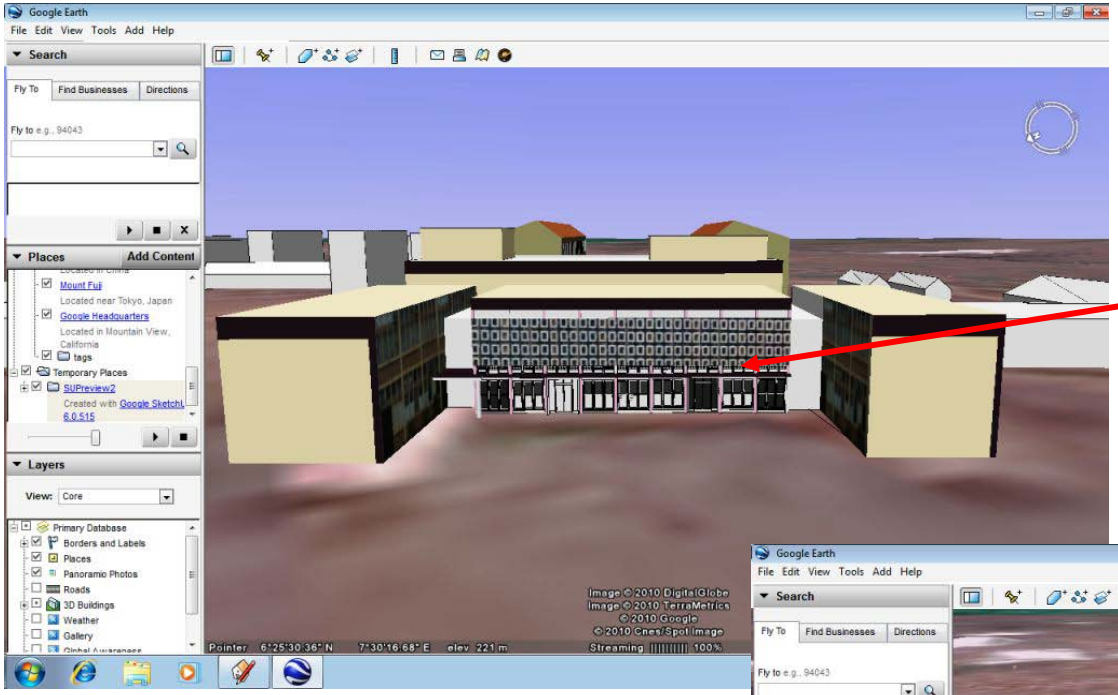


Lagos building in Google Earth

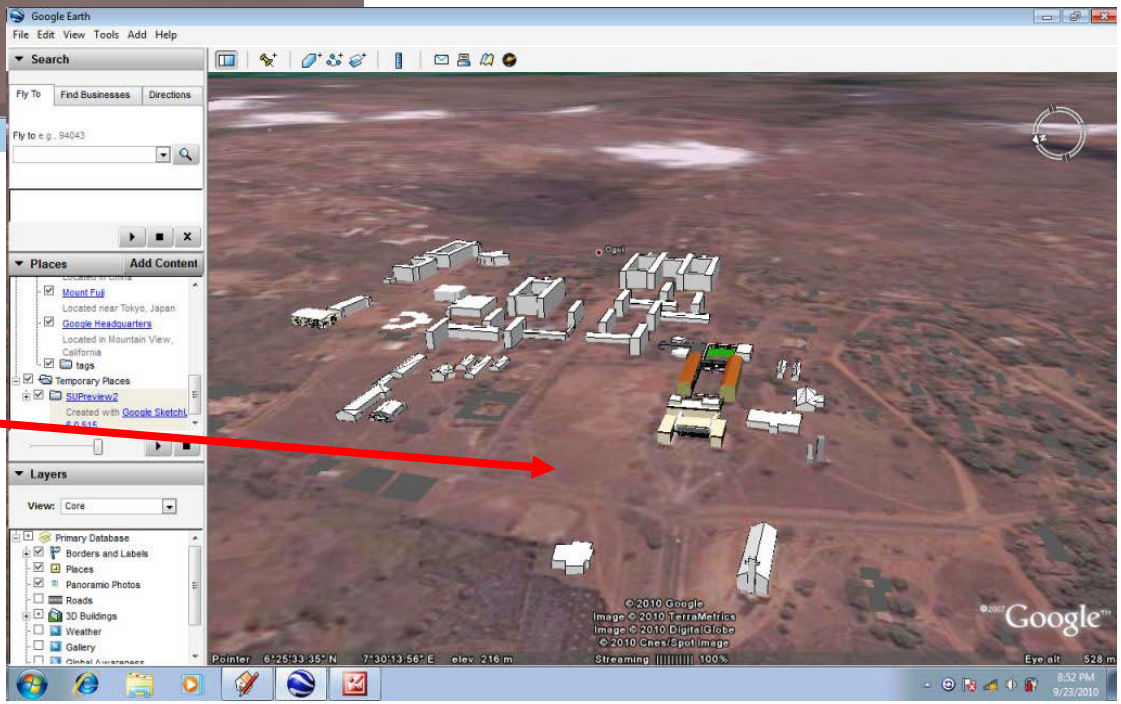


Side View of the Moot Court, faculty of Law University of Nigeria Enugu Campus (UNEC).

Results



Front View of the Main Hall University of Nigeria Enugu Campus (UNEC).



Aerial view of the Academic section of the University of Nigeria Enugu Campus (UNEC).

Conclusion

- **The study Presented concepts related to 3D modeling and visualization and some simple 3D modeling Tools**
- **Explored the effective use of 3D modeling for visualization of urban scenario using the University of Nigeria Enugu campus as a case study**
- **Demonstrate that simple photorealistic 3D model of urban built environment can be reconstructed with ArcGIS, Google Sketchup, and Google Earth**
- **The generated model can be used in evaluating design proposals**
- **Provide opportunity for urban planners and university official to properly visualize urban Scenario and making the right decision**


THANK YOU FOR LISTENING.