DEM OF ST. PETER'S MEDICAL COLLEGE CAMPUS

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Abstract : The aim of the project is to find the accuracy of DEM generated through the field survey with respect to Google Earth. The elevation data of the selected site is recorded with the help of Total Station and it is converted into an equal spaced grid data with the help of Surfer 14 software. The accuracy of DEM generated through field study is found to be good than the DEM generated from Google Earth.

IndexTerms – **Total Station, Digital Elevation Model, Surfer 14, Google Earth.**

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1.INTRODUCTION

A Digital Elevation Model (DEM) is a digital model or 3D representation of a terrain's surface commonly for a planet, moon, asteroid created from terrain elevation data.

A Digital Elevation Model is raster data set with a regular grid of elevation arranged by column and row. At each location the elevation is recorded. Elevations were historically recorded as integers to the nearest meter. But most high resolution DEM's now use 4byte floating point values.

Google Earth shows 3D building models in some cities, including photorealistic 3D imagery. The first 3D building in Google Earth were created using applications such as SketchUp. Google Earth is enclosed with data like X, Y and Z coordinates which can be used to generate contour map, surface map, DEM etc. A study on accuracy of DEM using field study with respect to Google Earth DEM is in need.

2.OBJECTIVES OF THE STUDY

1) To generate DEM of St. Peter's Medical college campus by using Total Station
2) To analyse the accuracy of DEM of St. Peter's Medical college campus with respect to Google Earth map

3.SCOPE OF THE STUDY

DEM is an asset in a variety of both commercial, public business and management fields within telecommunications, navigations, energy, disaster management, transportation, weather forecast, remote sensing, land cover classification, civil engineering and many more. The success of the project sometimes requires highly accurate elevation data with sufficient detail. Currently, several methods are available for obtaining the terrain elevation data of a given topography.
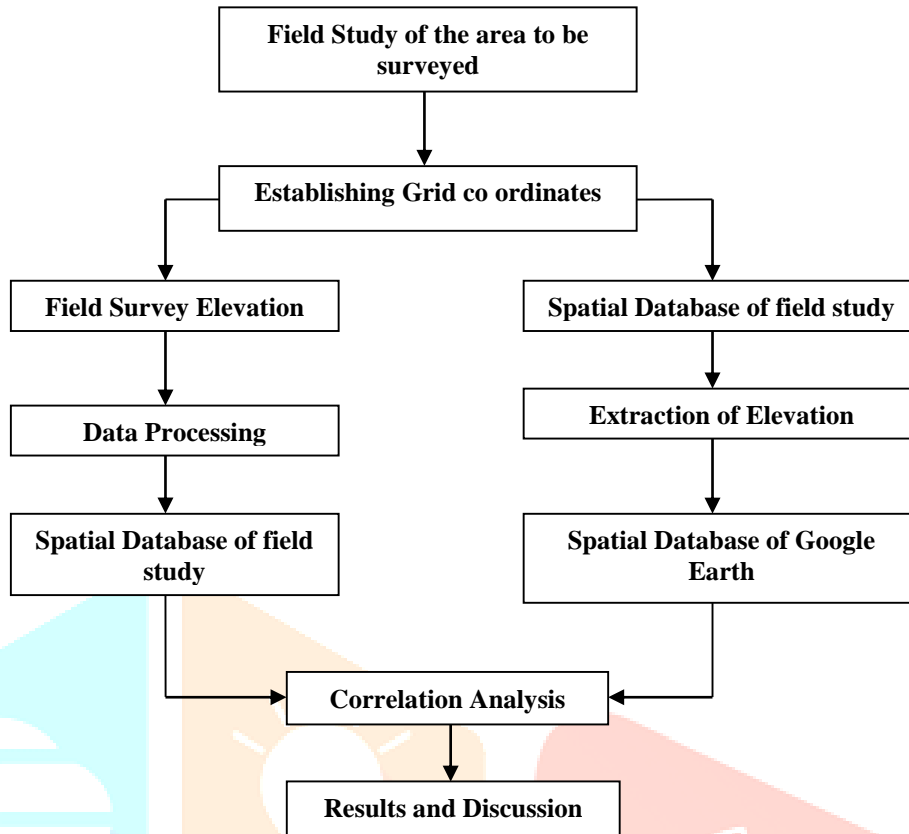
4.RESEARCH GAP

- Lack of evidences that determine the accuracy of Digital Elevation Modeling of field study [Total Station] with respect to Google Earth.

- Very few studies were only found in quality assessment of Digital Elevation Mapping generated from Google Earth.

- Thus, this exploratory study is designed to fill the gap on study in analyzing the accuracy of DEM of St. Peter's Medical college campus with respect to Google Earth.

5.AREA SELECTED

The area selected for our study is St. Peter's Medical College Campus located at Hosur, Krishnagiri District, Tamilnadu.
The area selected for study is at latitude 12.7409127° N and Longitude 77.825923° E. The MSL of the area selected is 871m (3000ft). The area covered was 5 acres (217800Sq.ft) with grid contour of 4m interval. For field study about 824 points were taken by grid contouring method was taken by using total station and DEM. For DEM of google earth points were taken from Google Earth and is generated with help of surfer 14 software.

6. METHODOLOGY

The methodology used in this study is depicted below

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        ┌─────────────────────────────┐
        │   Field Study of the area   │
        │   to be surveyed            │
        └─────────────┬───────────────┘
                      ↓
        ┌─────────────────────────────┐
        │  Establishing Grid co ordinates │
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    ┌──────────────────┐  ┌──────────────────────┐
    │ Field Survey     │  │ Spatial Database of  │
    │ Elevation        │  │ field study          │
    └────────┬─────────┘  └──────────┬───────────┘
             ↓                       ↓
    ┌──────────────────┐  ┌──────────────────────┐
    │ Data Processing  │  │ Extraction of Elevation │
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    ┌──────────────────┐  ┌──────────────────────┐
    │ Spatial Database │  │ Spatial Database of  │
    │ of field study   │  │ Google Earth         │
    └────────┬─────────┘  └──────────┬───────────┘
             └──────────┬────────────┘
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             │ Correlation Analysis │
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             │ Results and Discussion │
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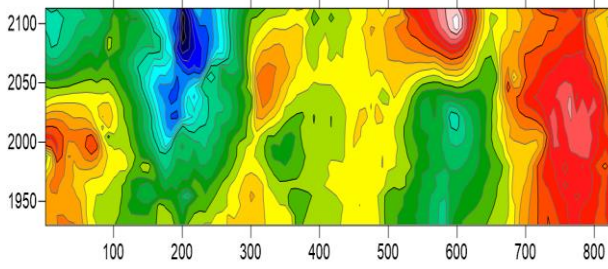
7. FIELD SURVEY RESULTS

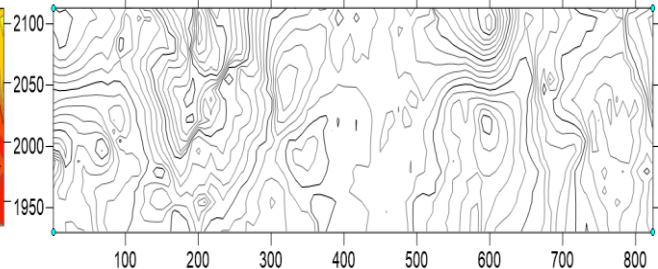**fig 1 grid data from field survey**

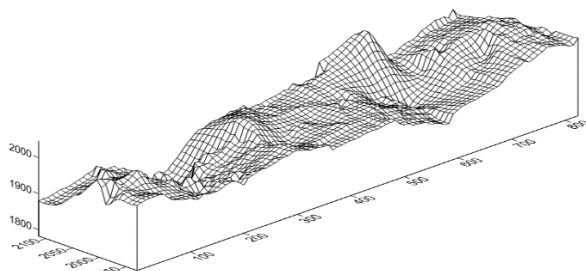
fig 2 contour from field survey

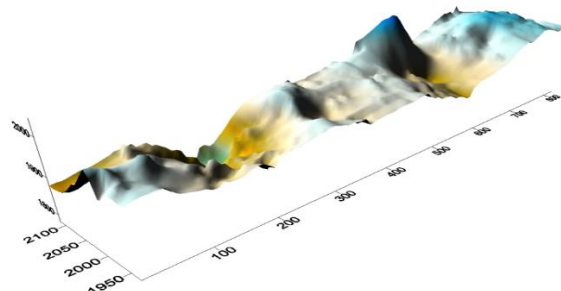**fig 3 dem –wire frame model from field survey**

fig 4 dem –surface model from field survey
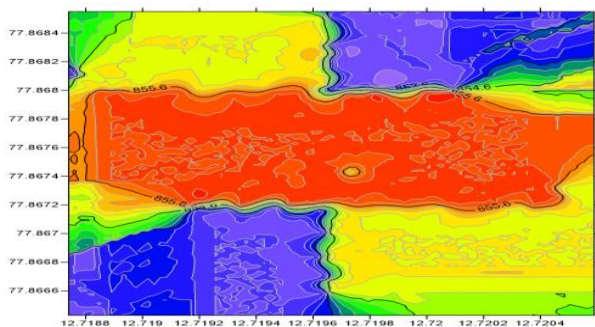
8. GOOGLE EARTH VALUES

fig 5 grid data from google earth
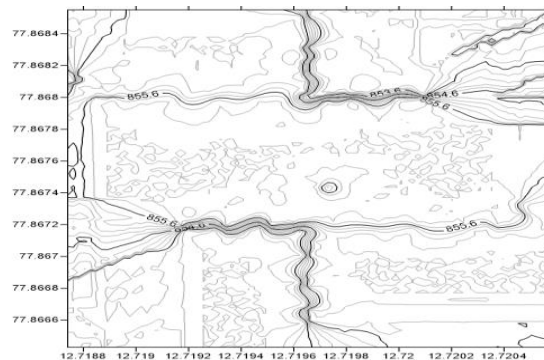

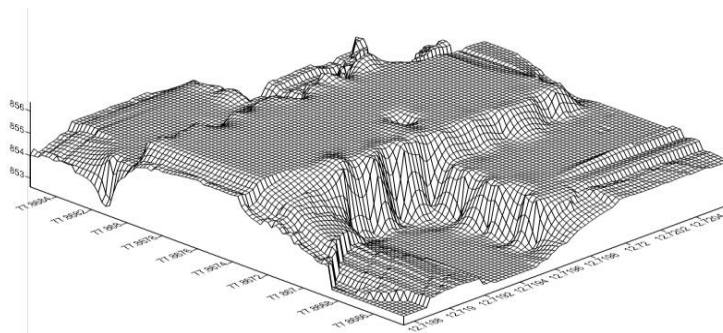**fig6 contour from google earth**

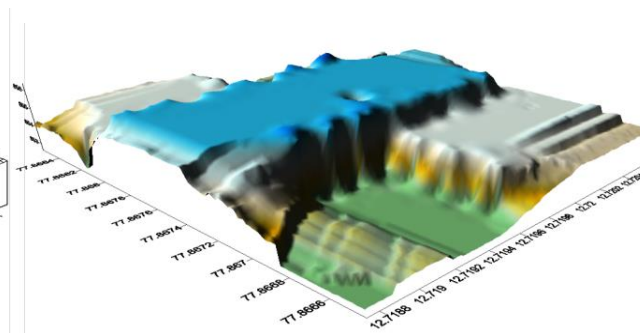**fig7 dem –wire frame model from google earth**

fig 8 dem –surface model from google earth

9.CONCLUSION

- From the Digital Elevation Model generated from field study is compared with standard values provided by Google Earth.
- The elevation difference shown in Google Earth is found to be very large i.e. of minimum 1m.
- The DEM's from the Google Earth does not perform well in collecting data for topographic works.
- It is found Google Earth elevation data can be used only for investigation and preliminary studies with low cost whereas field data can be potential source for Civil Engineering Projects.
- From the above comparison, it is found that DEM generated from Field study holds good when compared to Google Earth

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