



Development of a GIS Based Information and Management System for Cultural Heritage Site; Case Study of Safranbolu

Dursun Zafer SEKER

Mehmet ALKAN

Hakan KUTOGLU

Hakan AKCIN

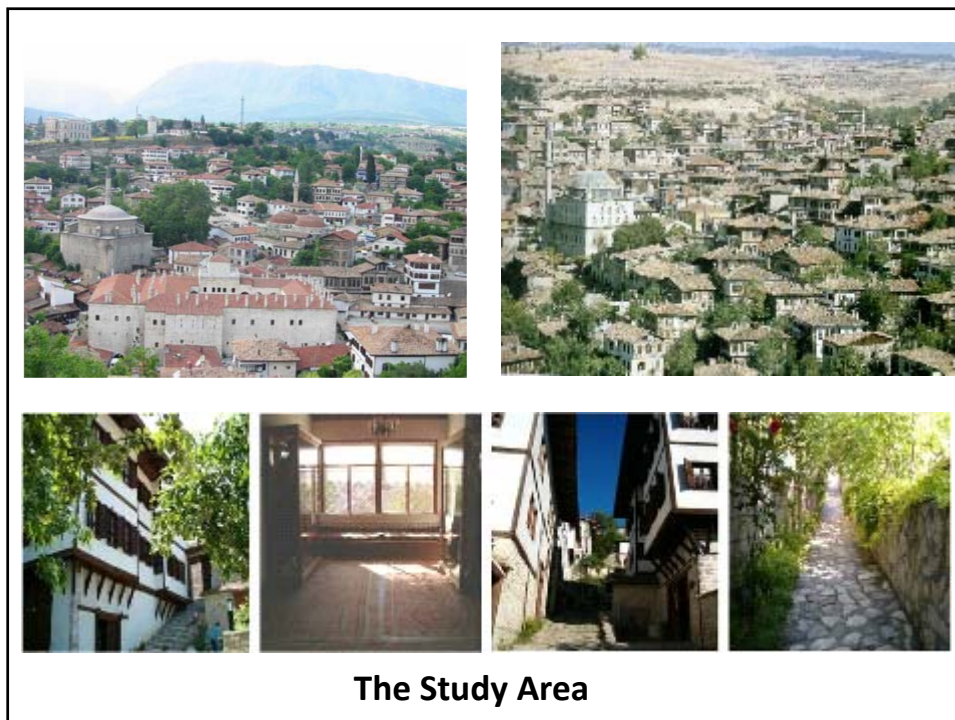
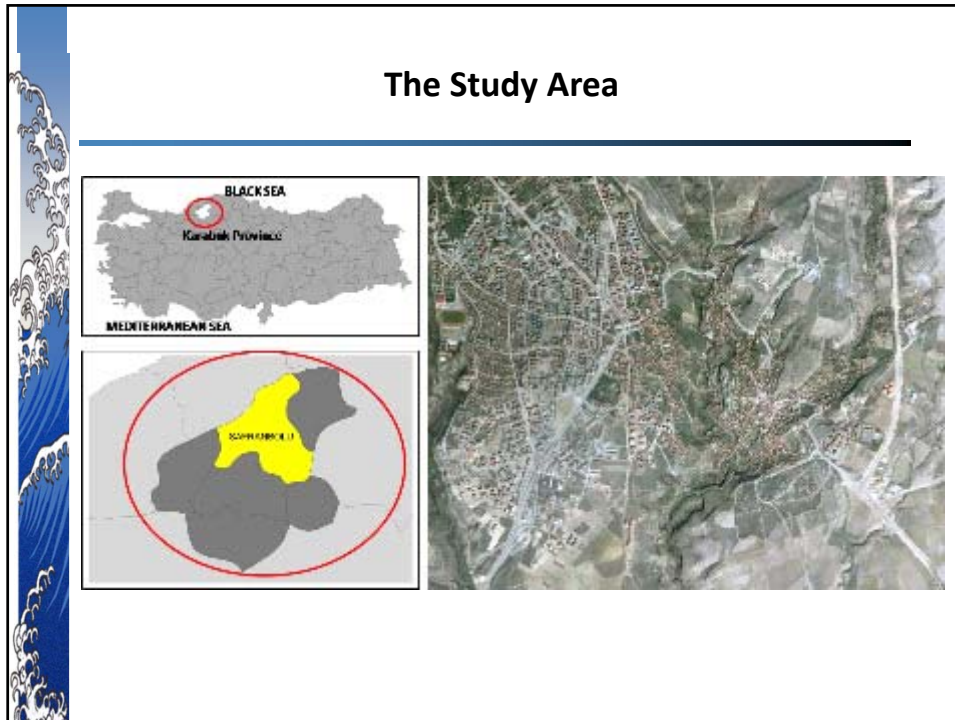
Yegan KAHYA

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Introduction

- Documentation of the cultural heritage sites is extremely important for monitoring and preserving,
- Turkey has many cultural heritage sites originating from the first human settlements in Catalhoyuk and Alacahoyuk and civilizations such as Byzantine, Seljuk and Ottoman.
- The nine cultural sites in Turkey are included in the protection list of UNESCO as cultural heritage and one of them is the city of Safranbolu.
- 3D modeling and digital recording of historical buildings in several locations of Turkey have been conducted and still continuing.
- In this presentation, outcomes and further studies of a research project supported by TÜBİTAK (The Scientific and Research Council of Turkey) will be discussed.

The Study Area



The Study Area

USED DATA AND METHODOLOGY

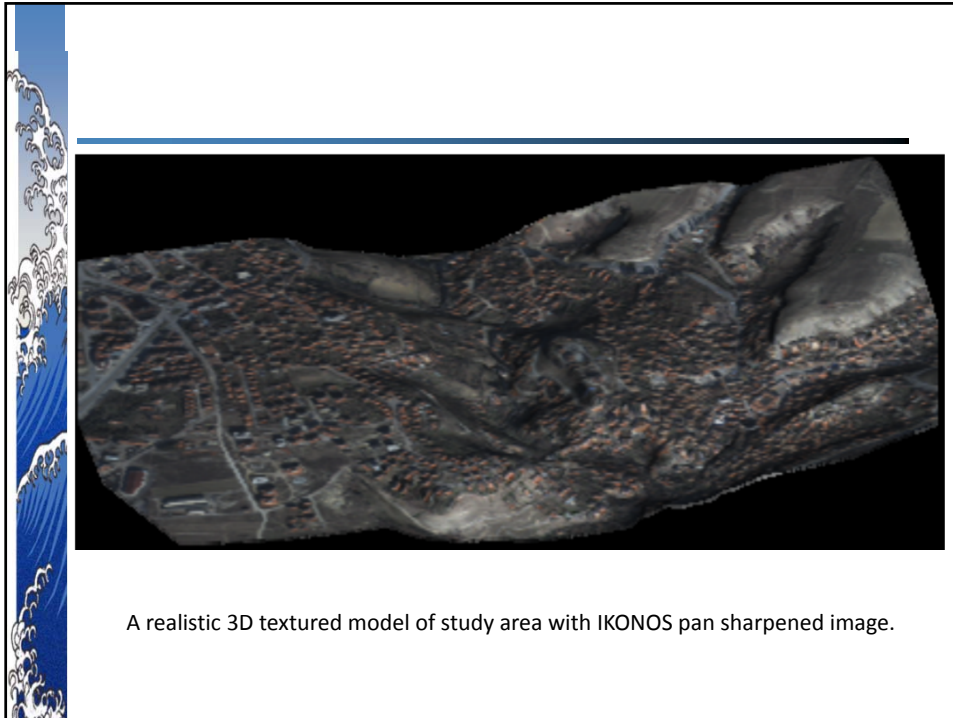
In this study,

1/1000 scale digital cadastral maps of Safranbolu obtained from the city municipality is used as the main topographic data.

Stereo pair of IKONOS satellite sensor data used to extract the height information of the the study area.



The vector map of the old city part and contour lines of the same part of the city.



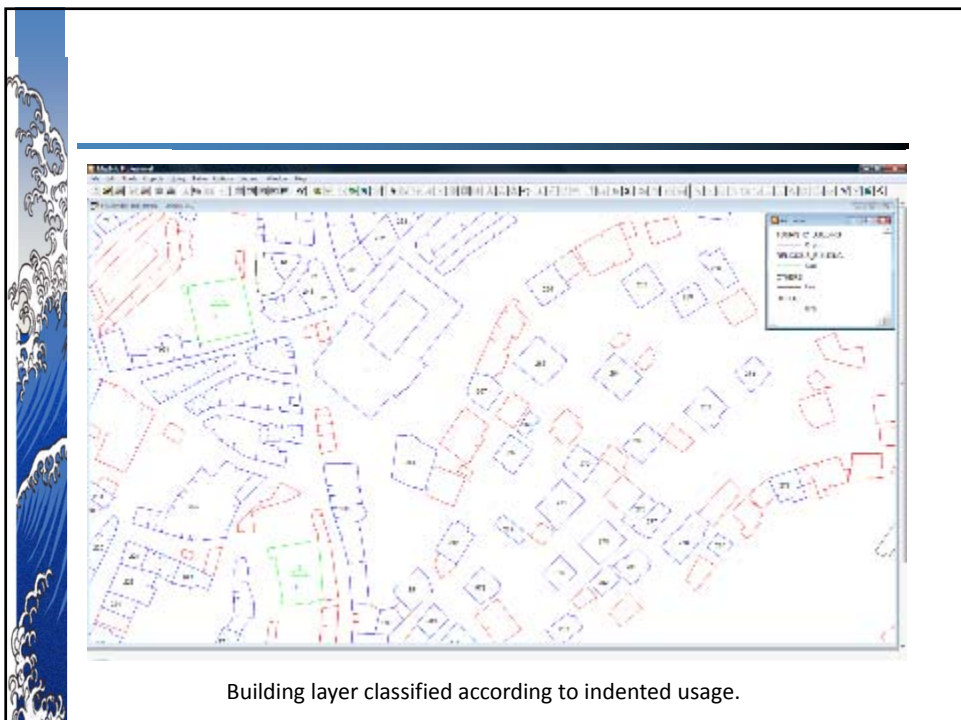
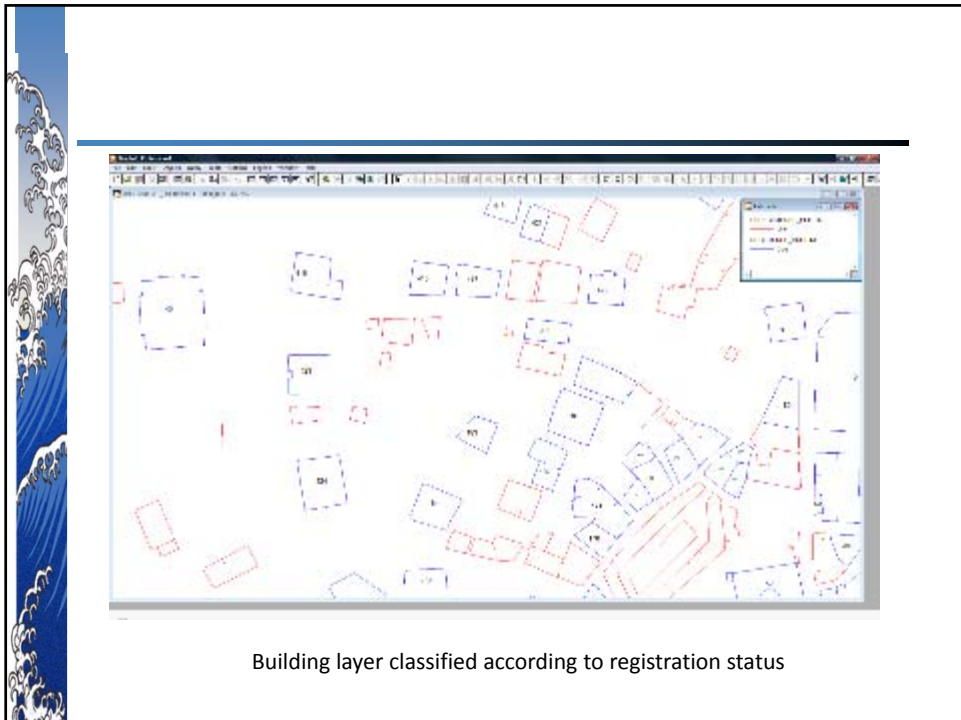
A realistic 3D textured model of study area with IKONOS pan sharpened image.

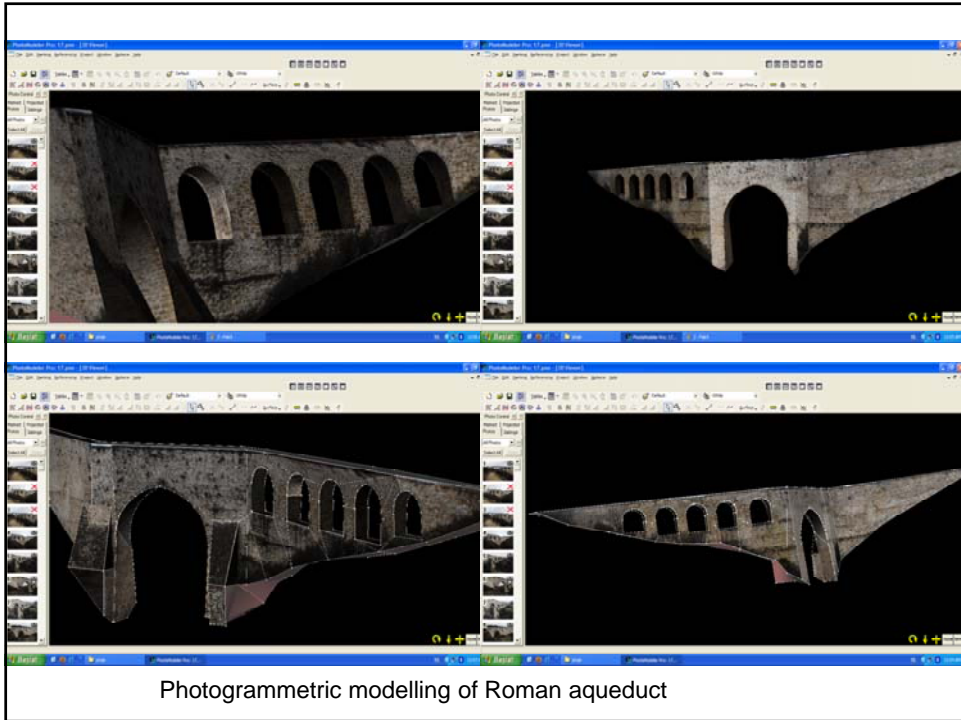
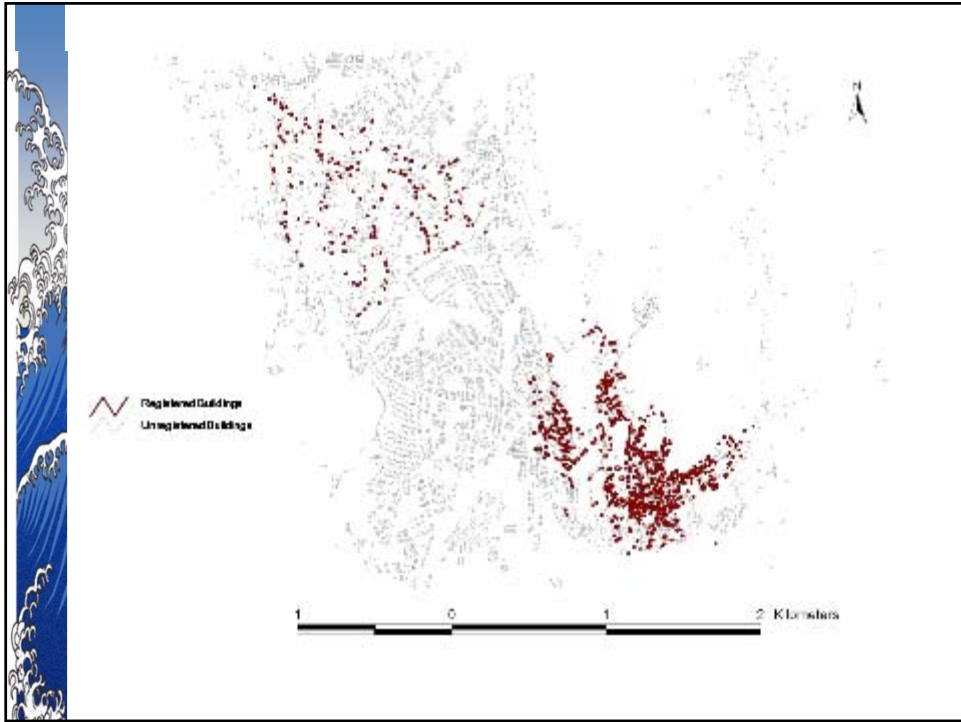
In the relational database established, historical structures and all related (current and historical) information of the building were collected and stored.

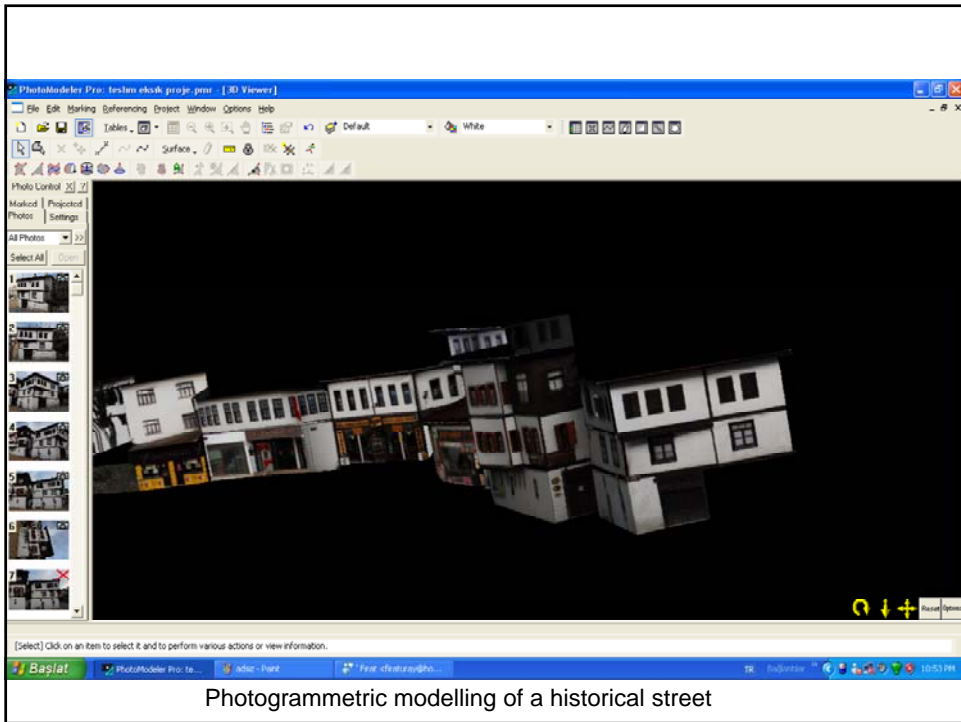
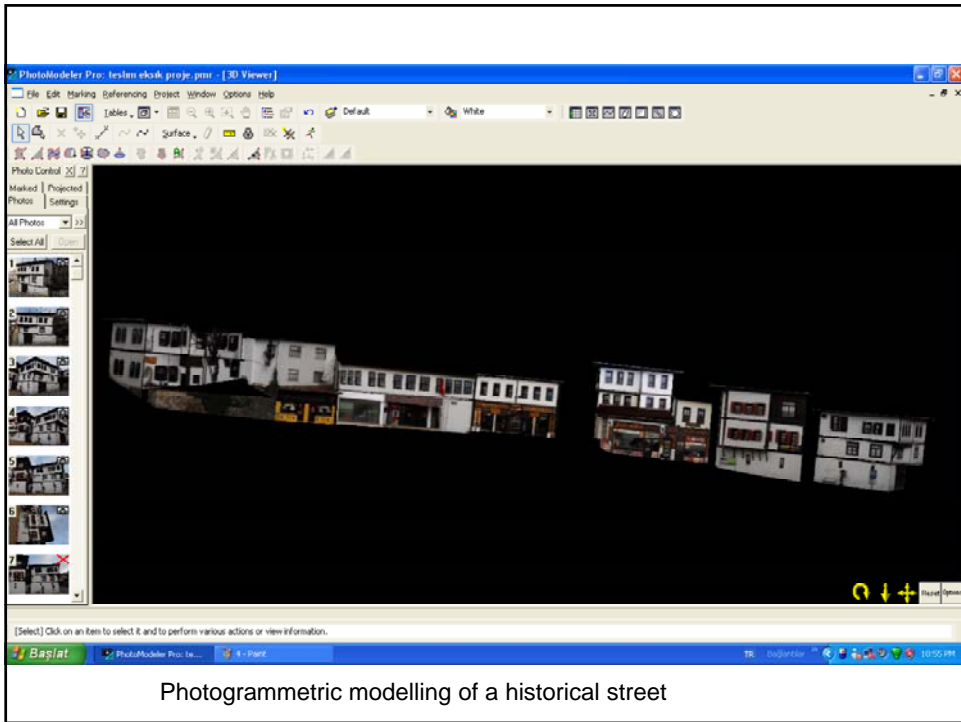
Selections from the collected large amounts of data were added to the database.

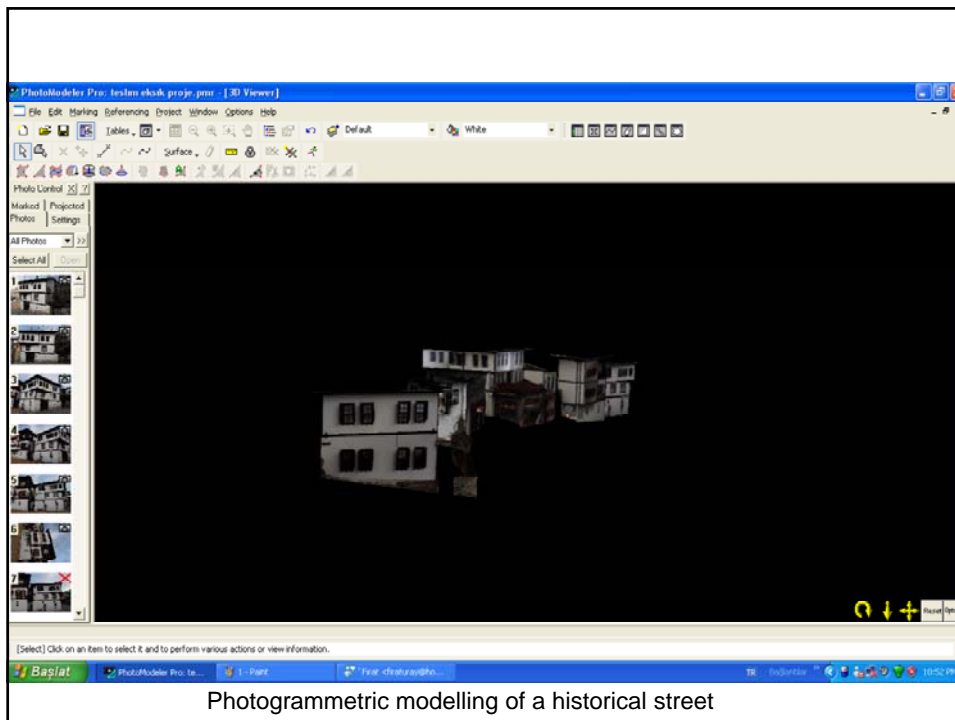
The database was designed as flexible format for the possibility of the new types of data might be gathered during the study.

Apart from historical structures, old roads were also considered.

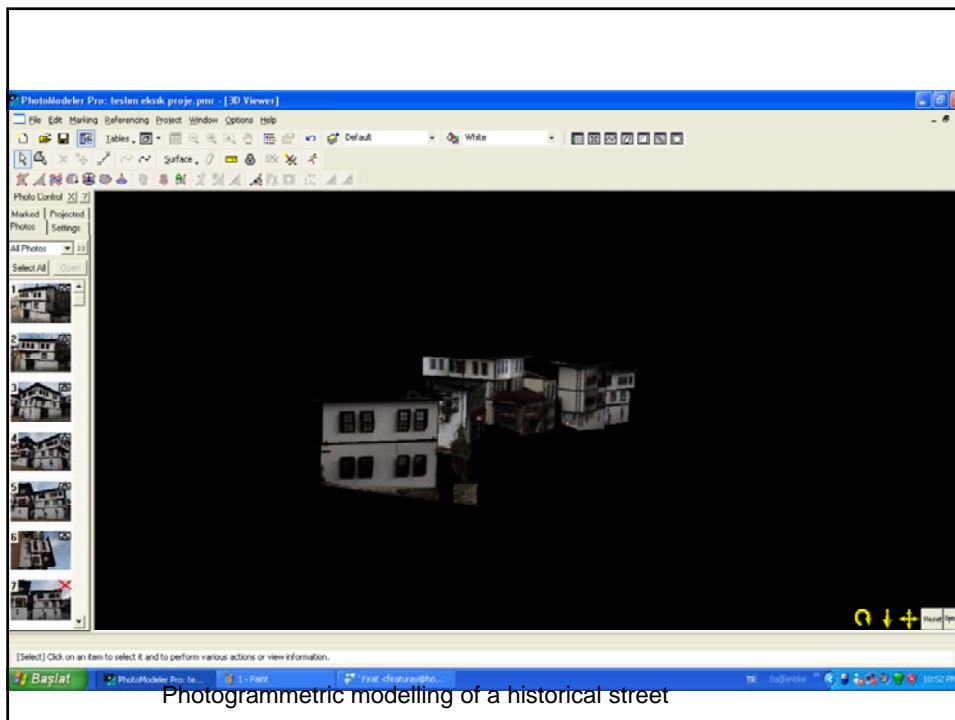




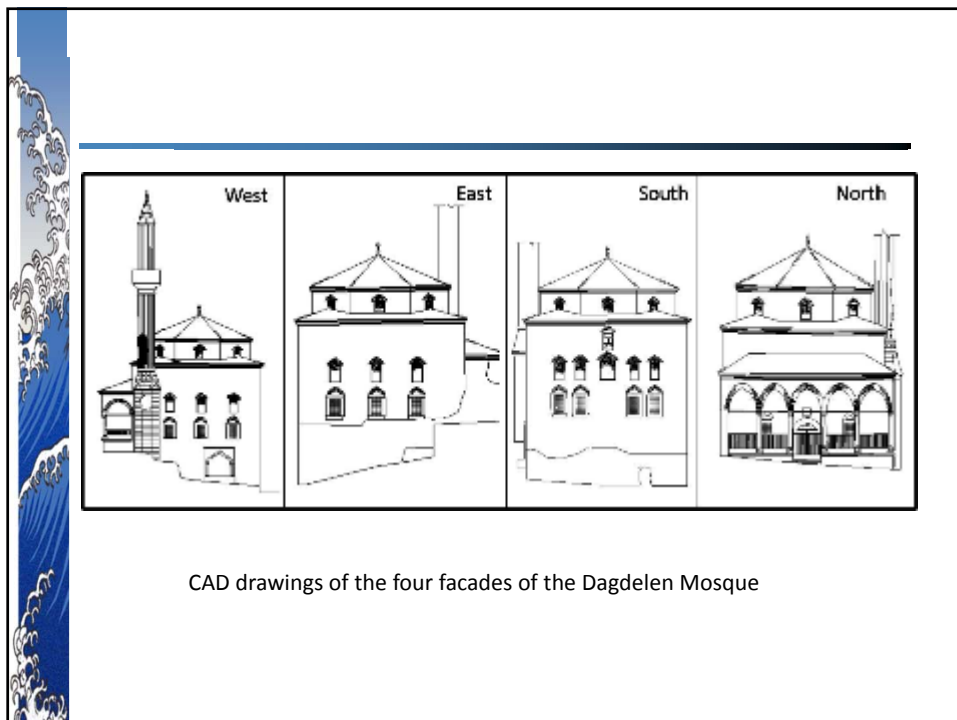
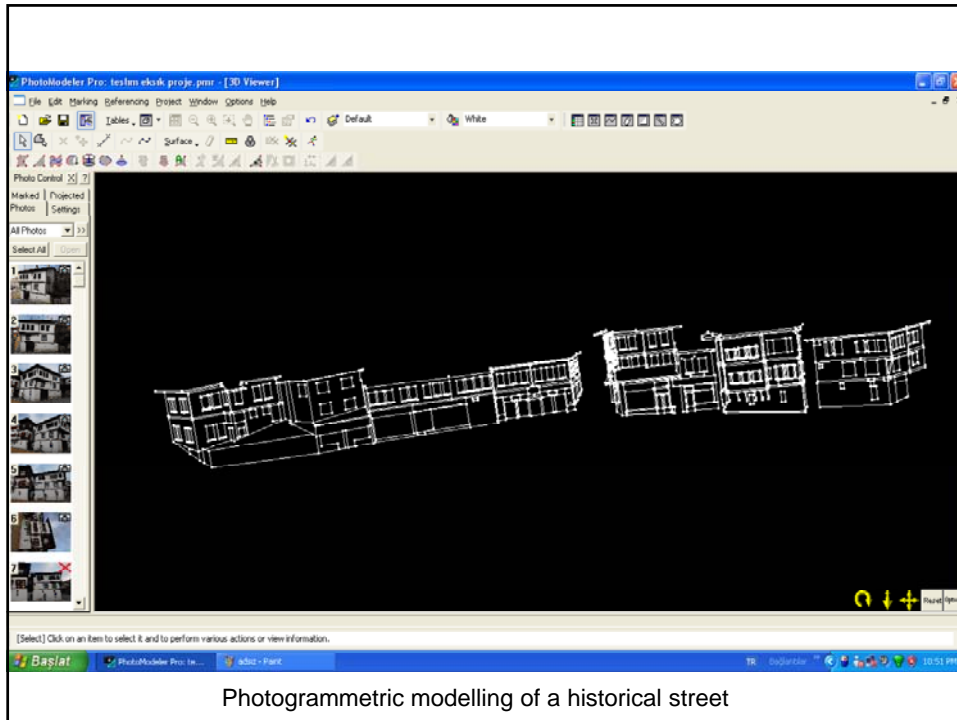




Photogrammetric modelling of a historical street



Photogrammetric modelling of a historical street







Conclusions

Turkey has a lot of historical sites which are under different threats and they should be retrofitted as soon as possible. Safranbolu was included in the "World Heritage List" by UNESCO in 1994 and as a world city because of its success in protecting its natural heritage is just an example in Turkey.

Recording analysis, protection and revitalization of cultural heritage sites are being undertaken by different approaches.

In this study, some outcomes of the project of a case study for digital recording and 3D modeling were given. The 3D models of the structures are significantly important for both obtaining sufficient information about the buildings and better visualization. Especially a realistic model determined by texturing will be helpful for the users to better understand the structures.

Conclusions

The related height information of the historical structures will be produced using a stereo pair of the high resolution satellite imagery and obtained data will be helpful for the modeling and presenting of the whole selected building in 3D via internet using established GIS.

In the next step of the project, all data (photos, videos, architectural drawings etc.) and models (3D and VRLM) related to selected historical building will be accessible via the internet. By this way many visitors will have a chance all over the world to visit one of the cultural heritages of Turkey and they will also have the opportunity to make different queries about the Safranbolu.

Similar studies oriented for modeling and preserving of the cultural heritage sites should be encouraged and supported by the decision makers. Based on the extracted results, development of an information and management system for documentation, protection and revitalization of cultural heritage sites was successfully undertaken and integrated to the GIS environment.

Thank you very much for
your attention...

Dr. Dursun Zafer Seker
seker@itu.edu.tr



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