

PHOTOGRAMMETRIC MEASUREMENT FOR THE KIZIL KILISE (RED CHURCH)

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FIG Working Week
- Integrating Generations
Stockholm, Sweden
June 14 - 19, 2008

Presentaion

- Where is the kizil kilise
- Location of AKSARAY
- KIZIL KILISE
- Short information of Aksaray history and KIZIL KILISE
- Photogrammetric survey
- Conclusion

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Where is the KIZIL KILISE

- KIZIL KILISE is in **Aksaray** [province](#) in TURKEY

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AKSARAY

- **Aksaray** is a [province](#) in central [Turkey](#). Its adjacent provinces are [Konya](#) along the west and south, [Niğde](#) to the southeast, [Nevşehir](#) to the east, and [Kırşehir](#) to the north. It covers an area of 7,600 km². The provincial capital is the city of [Aksaray](#).

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AKSARAY

- This is a region of great natural beauty: Aksaray is one of the four provinces in the much-visited area of [Cappadocia](#), along with Nevşehir, Niğde and [Kayseri](#).



Cappadocia

- Cappadocia is one of the most beautiful and fascinating regions of Turkey with an amazing landscape full of weird and wonderful rock formations, created by volcanic activity and then erosion.





Also the 3,000m volcano Hasan Dağı stands between Aksaray and [Niğde](#).



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AKSARAY HISTORY

- history of which dating back to Christ 8.th thousand, coming up to now preserving all its civilizations cultural existence, with natural beauty and with being trade centre, has not lost importance from any period



- Aksaray is in Middle part of Anatolia and also one of the most important centres of historical Silk Road. Aksaray is located on junction of east-west and north-south connected roads.



AKSARAY



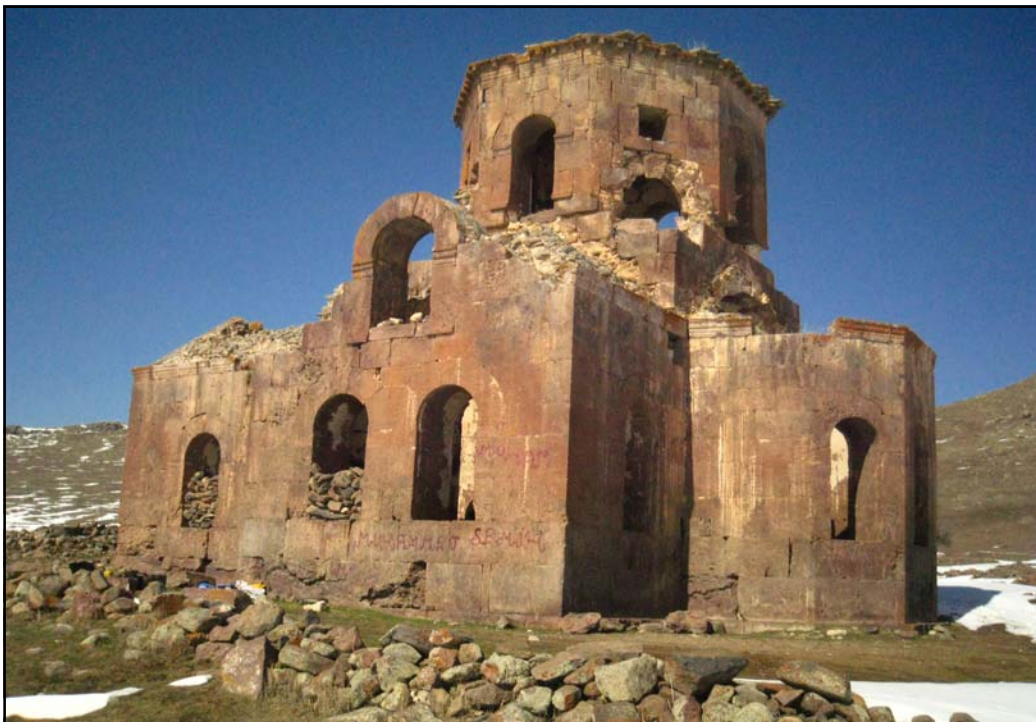
- In AKSARAY, one of the most important historical places that are cultural heritages is KIZIL KILISE (RED CURCH)



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The Red Church

- **The Red Church:** As it was built by using red cut stones, it is called “red church”. The church has a dome that rests on four pillars, built in V.Century. There are the portraits of the apostles and the paintings of biblical scenes in its frescoes..



- The church was included in the 2008 List of 100 **Most Endangered Sites** of the World Monuments Fund in early June. The list, which consists of 100 historic sites from 60 countries, also includes four other sites in Turkey:
- Batman's historical district of Hasankeyf
- Çukur Han in Ankara
- Meryem Ana Church (Church of Mary) in Göreme of Cappadocia,
- Byzantine walls of Istanbul.



www.worldmonumentswatch.org/



ABOUT THE WATCH

The World Monuments Watch is a flagship program of the World Monuments Fund. Announced every two years, the World Monuments Watch List of 100 Most Endangered Sites calls international attention to threatened cultural heritage around the world. Watch listing does not convey permanent landmark designation, but rather it seeks to promote public awareness of the key threats to sites at risk and encourages solutions at local and international levels. Since the program's inception in 1996, more than 540 sites—from the famous and familiar to the unexpected and remote—have been selected for inclusion in the Watch. With each new Watch announcement, WMF challenges the public to broaden its awareness of the richness and fragility of our shared cultural heritage.



Geril


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100 MOST ENDANGERED SITES, 2008



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Red Church


Location of Site: Güzeyurt, Sivrihisar, Cappadocia, Turkey

Date of Significance: 6th Century

Years on Watch List: 2008

Primary Threats: Structural instability of dome, Lack of protection

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100 MOST ENDANGERED SITES, 2008



Red Church

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Date of Significance: 6th Century

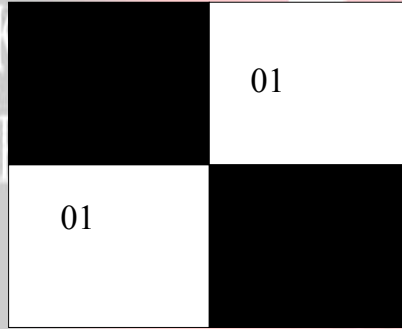
Years on Watch List: 2008

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- For this purposes, 20*20cm² paper numbered plates (target plates) which can be recognize on the photographs were prepared to use field studies



- Target numbered plates were fixed conveniently distributed on the surface of the church and measured from traverse points by using reflectorless total station.



- The Topcon GPT-3000 Series are Pulse Laser Total Stations with a superior non-prism measurement capability.



Measurement accuracy is

$$\pm(2 \text{ mm}+2 \text{ ppm})$$

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- Photographs of the RED CHURCH were taken by CANON IXUS 17 ZOOM digital camera from different locations as stereoscopically



7 Milyon mega pixel

f=6,3943mm
xpp=2.7955mm
ypp=2.1083mm

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software :

PhotoModeler®

- PhotoModeler software was used in this project . PhotoModeler is a windows based photogrammetry software developed by Eos System Inc

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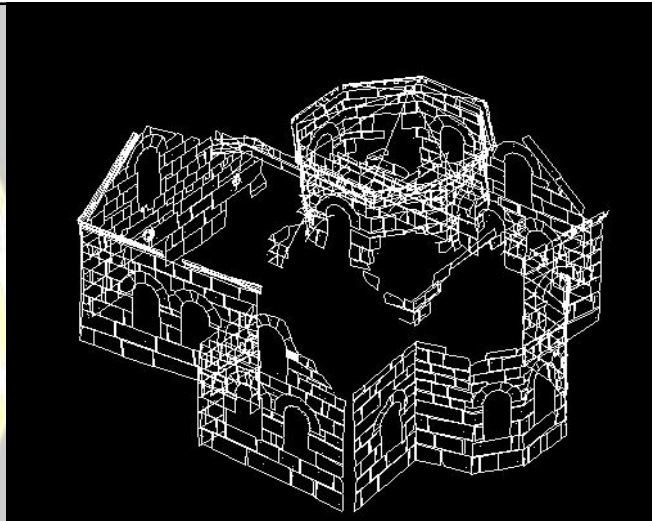
6 basic steps were needed to create the 3D-model out of the photographs using photomodeler software.

- Photo-Import,
- Marking of object points
- Identify and reference the identical marked object points.
- Calculation of the camera positions and orientations.
- Adjustment and Scaling the model
- Export of the data to other CAD packages

dxf (2D ve 3D),
3D studio,
Wavefront OBJ,
VRML (1 ve 2),
Raw ve Microsoft
DirectX etc.

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- In this project all obtained data transferred to DXF file. Because the restorers of Turkey are using dxf files to prepare preservation projects.



- Dxf format



- NEXT STEP

- laser scanner will be used to obtain point clouds and some textured models of the Red Church
- ILRIS laser scanner will be used to obtain the all data

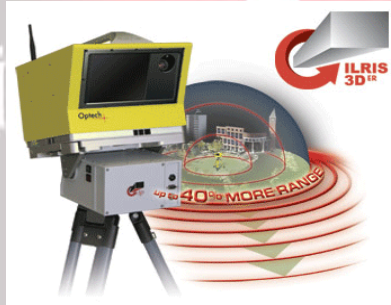


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CONCLUSION

- Historical and cultural heritages are one of the most important connections between old civilizations and today's modern societies.
- Conservations of cultural heritages and transfer to next generations are both our personal and social duties.
- Determination of the present position of these cultural heritages, documentation, and restoration are historical responsibility

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- Most of the cultural heritages are about to destroyed due to lack of interest.
- In recent years, In TURKEY, photogrammetric methods are being used for documentation of human being' common cultural heritages.



- With this technique, documentation studies can be completed much more economically and at short time with respect to classical methods.
- photogrammetry use only mathematical equations and photographs. There is no need extra technical employee. There is no contact with object directly. For this reason, it is reliable method.



- Restoration work for the Sixth Century Orthodox Kızıl Kilise (Red Church) in Aksaray's Güzelyurt district has started.

It is expected to cost more than \$400,000

The restoration will be funded by the Cappadocia Enthusiasts' Association, and take three years



Thank you very much for your attention

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