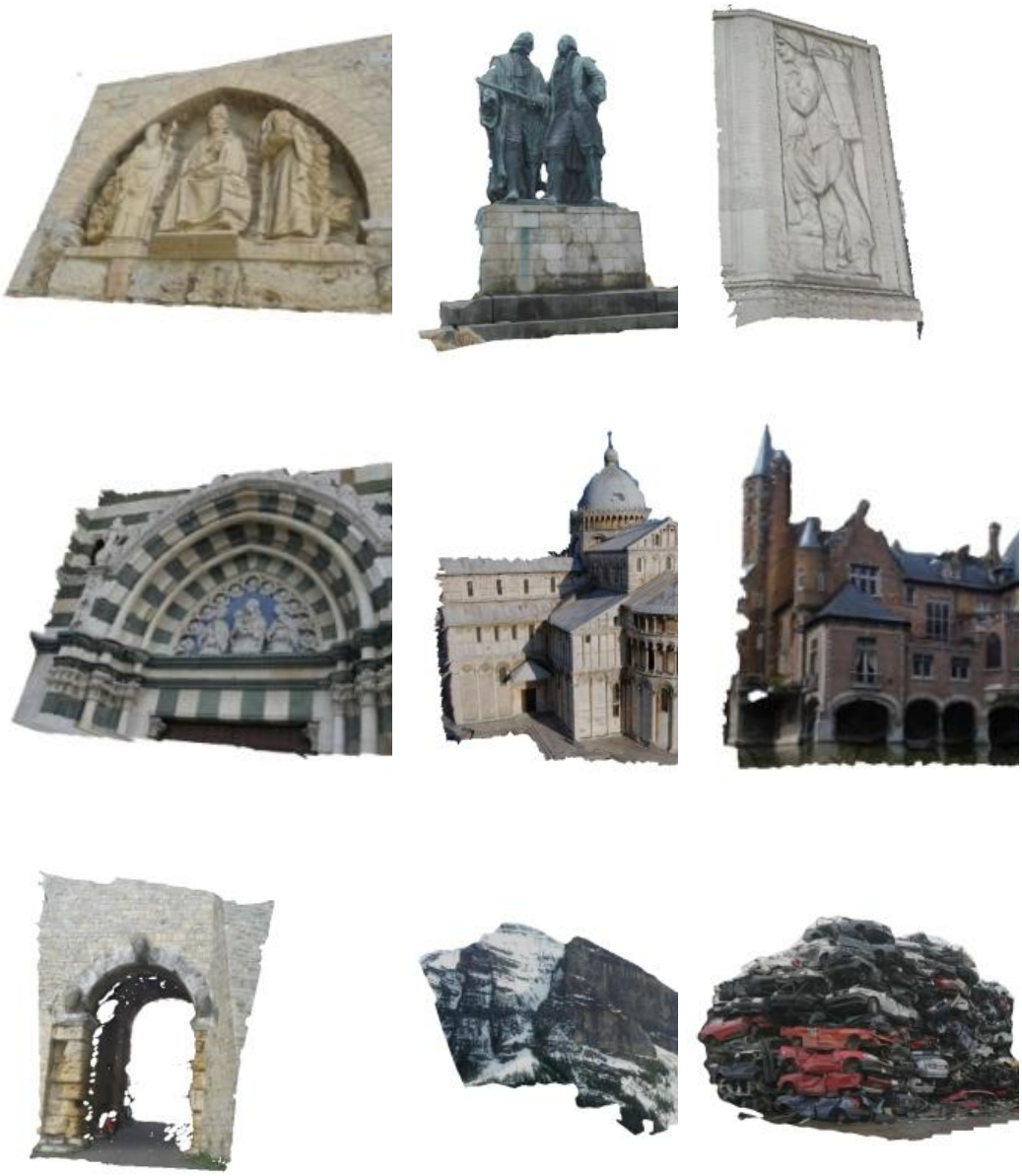
3D Photography Gallery

Everybody can now make pictures in 3D, with a regular photo camera and the ***free*** ARC 3D website. You only have to take a number of pictures from an object from different angles, load it onto the website and you will be notified when you can pick up the 3D photo from the ARC 3D ftp-site. With the ARC 3D model viewer you can generate your 3D model, ready for viewing on the Internet. For this you need to save it as a vrml or x3d file and download a 3D viewer from the Internet for viewing in a web browser. You can also save the model in other higher quality formats. The ***free*** MeshLab software provides professional tools to enable you to refine and enhance your 3D model.



ARC 3D Webservice - A Family of Web Tools for Remote 3D Reconstruction

The Webservice

We have developed a group of tools, allowing users to upload digital images to our servers where we perform a 3D reconstruction of the scene and report the output back to the user. We also provide a tool for producing and visualising the 3D scene using the data computed on our servers.

Uploading Images

The first simple application is the upload tool. All that is required is that a sequence of images is uploaded to the server. The order of the images can be set by the user, and the images can be subsampled before uploading for a faster service.

While You're Waiting

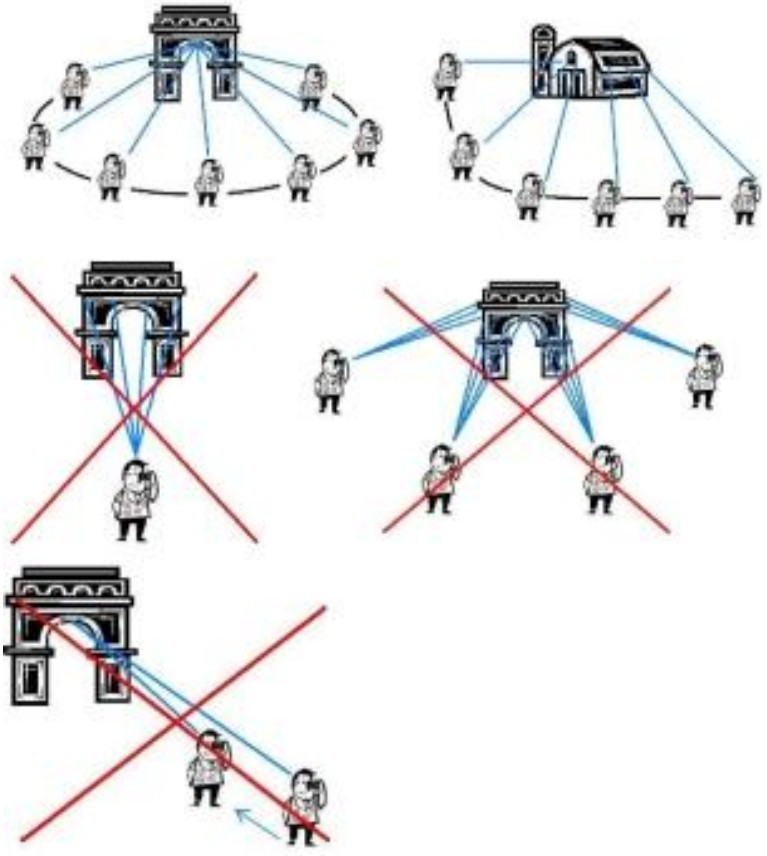
This is where the service really does its work. At ARC, we have developed software to compute the reconstruction over a distributed network of PCs. This makes our procedure much faster and also more robust. Depending on the size, number and quality of the images that have been uploaded, a typical job may take from 15 minutes to 2 or 3 hours.

Building a Model

Once the reconstruction has been successful, the system notifies the user by email. They can then use this data to produce a 3D model with the model viewer tool.

STEP 1

- Shoot a picture of the same location for every step made in the shooting sequence. This results in multiple pictures of the same scene, but viewed from slightly different sides.
- Walk with the camera in an arc around the scene, while keeping the scene in frame at all times.



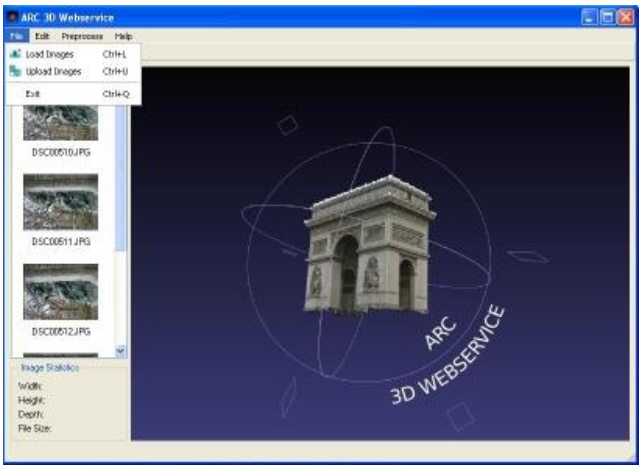
The key to a good 3D photograph is to have matching points in at least 3 different pictures. This means that you need to take enough overlapping pictures in a circular way around the object. The cause of bad pictures is often:

1. Not enough pictures
2. Pictures do not overlap
3. Images are blurry
4. Sunlight and shadows cause that the object appears too different in the pictures to be matched
5. The object is moving (people, a flag in the wind,...)
6. The object reflects too much (windows, cars, ...)which causes that the object appears different from different angles
7. The object is very thin (branches of trees, bars of a gate,...), which makes it difficult to take overlapping pictures
8. Areas with little or no texture (blue sky, painted walls) don't hold much 3D information.

STEP 2

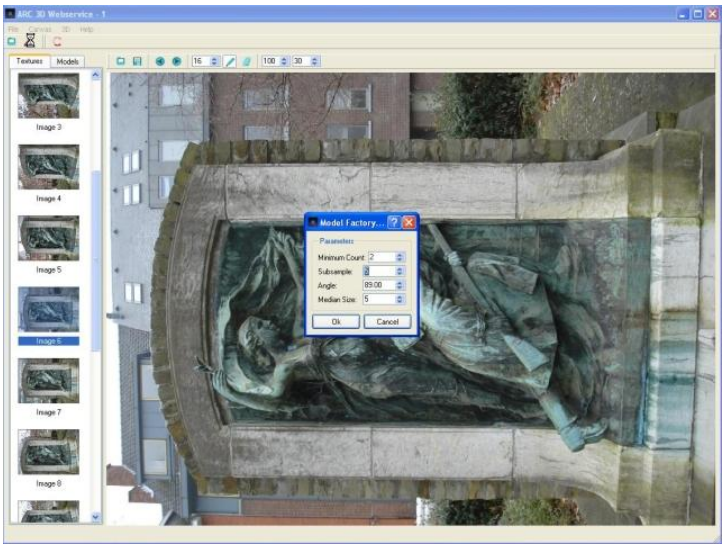
- Get your login password from the ARC3D website
- Download the ARC3D Uploader/Viewer tool

STEP 3
Upload the pictures to the ARC3D webtool with the downloaded software.

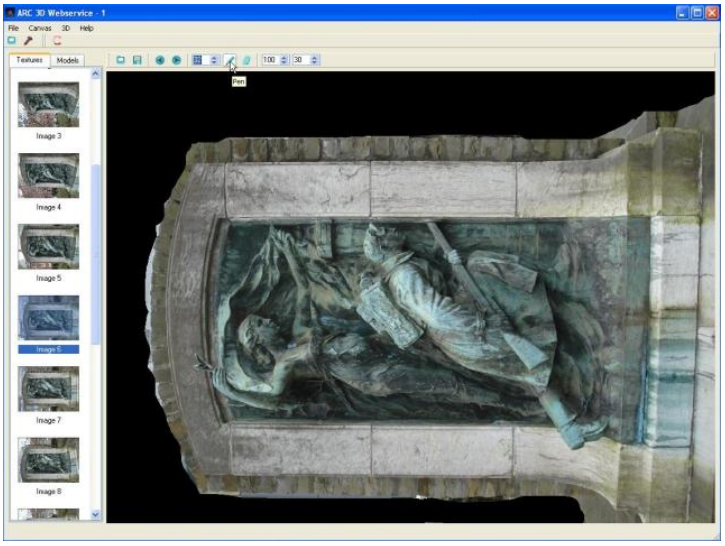


Wait for the e-mail with the confirmation that the model is ready and download the model from the given ftp-site.

STEP 4
Open the modelviewer of the ARC3D webtool and load the reconstruction. Choose an image on the left as the texture file (best is the frontal view)and subsample the model (for webpresentation this is strongly advised even to a scale of 6/7 times depending upon the image size)for a smaller file.



You may want to use the pen tool to black out part of the texture image. This makes the model cleaner as edges and areas like blue sky are often misinterpreted by the system.



Click OK when you are ready and the system will start preparing the 3D model. When it is finished you need to click on the models button in the left top corner to view the result. Now you only have to export the file in 3D (using the button in the top menu) to your desired format (vrml, osg, iv, obj, ply, x3d).

STEP 5

To enhance (smooth, fill holes, clip, refine mesh, ...) the 3D model you may use the free MeshLab software (loads ply and obj)or any other commercial 3D software.

Example: Etruscan gate in Volterra, Italy. (Photos: Paul Konijn)