

3D CSI TOOL

TNO innovation
for life

The TNO 3D scene reconstruction tool allows you to quickly create a realistic 3D model of a real-world scene with just a portable, hand-held camera and a laptop computer.



The TNO 3D scene reconstruction tool provides a solution for your challenge of accurately modeling a real-world scene in 3D within a short time period. Numerous applications for the tool can be found in areas such as crime scene investigation, car crash registration, engineering, construction work or entertainment productions such as movies or computer games.

The tool is beneficial for your particular application if you require a 3D scanning device that is

- **Fast:** only the recording of the scene itself requires user action and is done in a matter of minutes.
- **Easy:** just move the hand-held camera through the scene of interest. The tool selects the best images and removes images with similar viewpoints.
- **Small:** only the small camera needs to be moved around the scene. The device can therefore be used to model areas that are difficult to access.
- **Accurate:** After a scene is captured and automatically reconstructed, you can take arbitrary measurements (mm) of objects in the scene.
- **Convenient:** because a 3D model is obtained, viewing or taking measurements in the scene does not require anybody's presence at the scene once it is scanned.
- **Non intrusive:** you do not have to place artificial markers. Therefore, the scene remains undisturbed during the recording sessions.
- **Outputs multiple formats:** you can get the results in the format that you want: raw 3D points or as a textured polygon mesh file as used by popular design or render software packages such as AutoCad or 3D studioMAX.
- **Low Cost:** unlike 3D laser scanning devices, the software tool only requires a relatively inexpensive camera and a laptop computer.

FAST CAPTURE

The 3D reconstruction tool makes use of a custom-of-the-shelf camera, such as the Kinect camera, a stereo camera or a normal photo or video camera. You only need to make sure to capture sufficient views of the scene. This is done most easily by thinking of the camera as a painting device with which to "paint" every spot on the scene. Capturing a scene is the only manual labor required. For a small scene such as an indoor scene this is done in a couple of minutes.

AUTOMATIC RECONSTRUCTION

After you have captured your scene by hand, the software of the TNO tool automatically creates a 3D reconstruction based on your recordings. The tool selects the best images that cover all recorded viewpoints of the scene. Images that are very similar to the ones already selected are automatically identified and discarded. The tool then proceeds to compute the exact camera position, orientation and distance to the scene. This information is combined into a single reference frame to build the final 3D model of the scene.

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TNO focuses its efforts on seven themes including Defence, Safety and Security: TNO works on a safe and secure society by creating innovations for people working in defence organisations, the police, emergency services and industry.

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