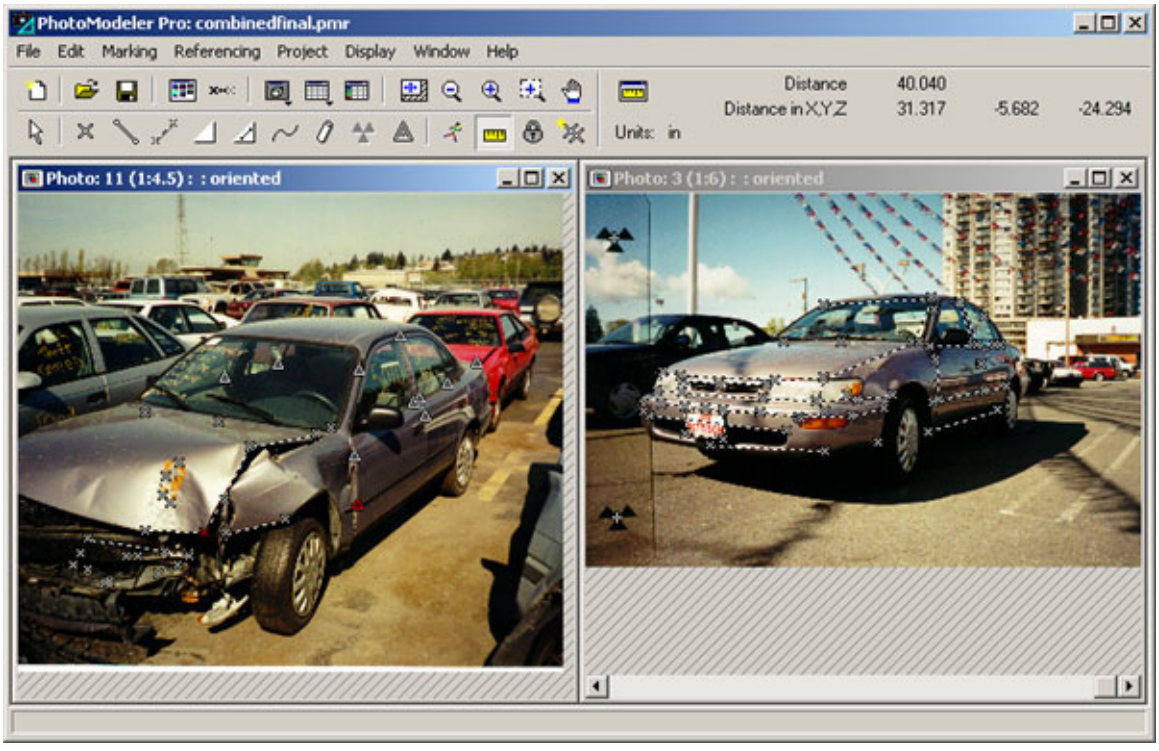
Accident Reconstruction Example Projects

The following demonstration projects are provide by Eos Systems Inc., the developer of the Photomodeler program.

Vehicle Crush Measurement

This project was undertaken by Eos Systems to demonstrate PhotoModeler's ability to compare a damaged vehicle against an undamaged vehicle all within the same session thereby producing accurate crush measurements. Two cropped photographs of a crushed 1997 Corolla were provided and no information about the camera used to take the photos was available.

Our first step was to find an exemplar undamaged vehicle at a local car dealer Photos were taken of it using our own calibrated camera. Then we used PhotoModeler to model the exemplar vehicle, paying special attention in modeling the area around the front bumper. We also modeled areas that appear undamaged in the crushed-vehicle photographs to help us link the two models together.



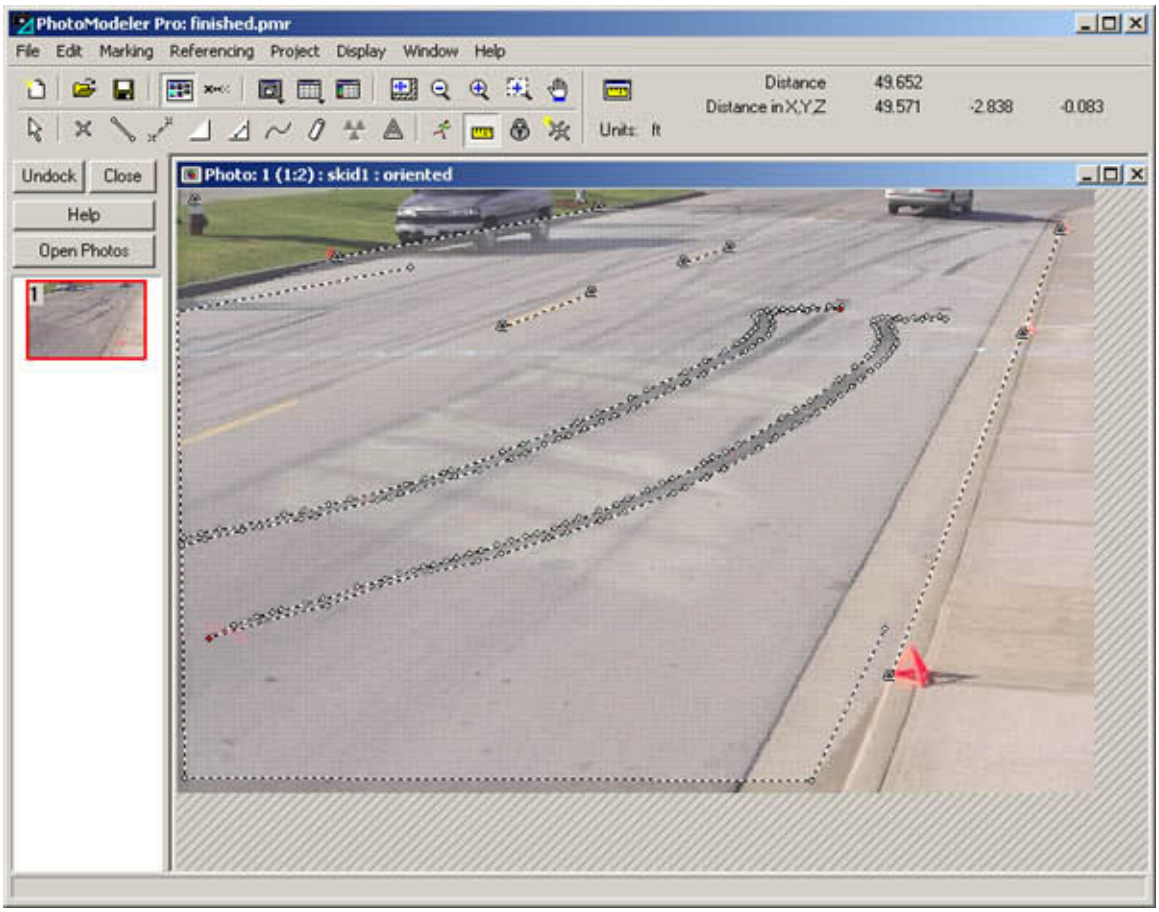
With an exemplar model in place, we used PhotoModeler Pro's Point Properties feature to freeze the 3D points on the exemplar model to act as control points. Next, we imported the crushed images into the same project and set them for Inverse Camera processing.

Once we marked and referenced points from the exemplar vehicle with matching points on the crush photos, we were able to perform Inverse Camera, orient the images, then continue marking on the crush images.

To complete the project, we performed distance and comparison measurements to extract crush displacements. These measurements were all made within PhotoModeler eliminating the need for an external CAD program.

Skid Mark Mapping Project

This project demonstrates the ability of PhotoModeler to extract information from a single photo of a skid mark from an unknown source. Using only this photo and some control points, we determined the length and shape of the skid mark.



The first step was to gather some known 3D infomation from the existing scene that also appeared on this photo. We suveyed the scene to generate this control point information. We then marked the control points on the single photo, and performed Inverse Camera.

Inverse Camera uses the control points to determine the characteristics of the unknown camera. These control points were not on the skid mark itself as the skid mark would normally be gone by the time of the survey. Instead, the control points are on features that exist in the photo and the scene as it stands today, with emphasis on extracting the surface of the road. Items such as divider lines, sidewalk cracks, and signs are typically used for control points.

With the camera solved, we were able to continue work on the project. We connected the various control points with Surfaces. With the surfaces covering the road, we used Surface Draw to trace the shape of the skid mark. Surface Draw allows us to mark on a surface in an oriented photo and 3D point locations are calculated. We were then able to measure the length of the skid mark using PhotoModeler's Measure tool.

The final step was to export the surface information as an orthographic photo. PhotoModeler's Ortho Photo Export removes perspective and shape distortion from the image. This allows us to see the true shape of the skid mark.