SUCCESS STORY - MULTIMEDIA

The Apple Tree and the Apple Picker

Convinced that 3D scanning is bound to technological limits? Persuaded that even the most committed must sometimes forfeit in the face of unworkable projects?

Well…be prepared to have your beliefs shattered.

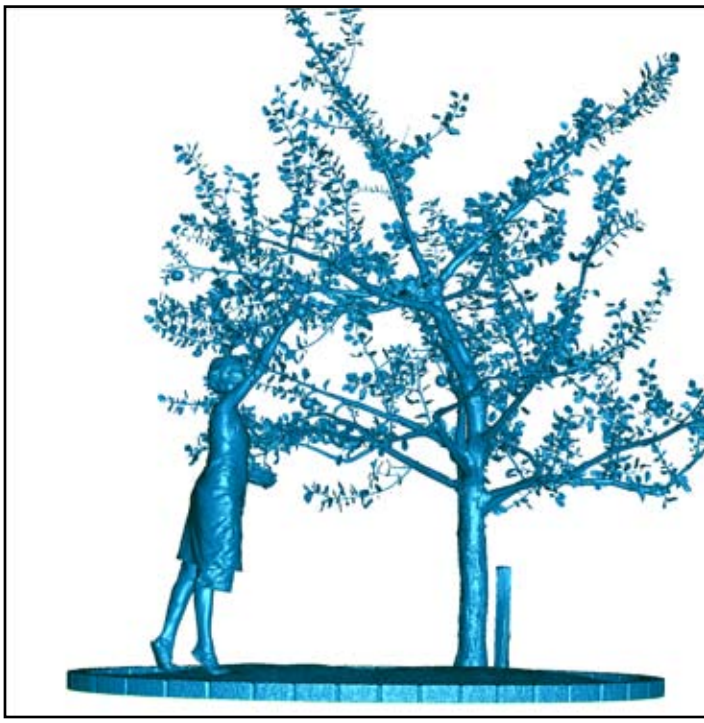
The project recounted here was carried out as part of Creaform's Annual 3D Scanning Contest, that ran under to theme "The Four Elements". The members of one of the participating teams put themselves to the challenge of creating something that has never been done before and to do it in the most visually pleasing way possible.

After thorough reflection, the team resolved to try and scan what first seemed barely impossible to do: an apple tree. An actual, live apple tree!

OK. So now you're thinking: "Mission impossible". Not so sure…

THE PROJECT'S LOGISTICS

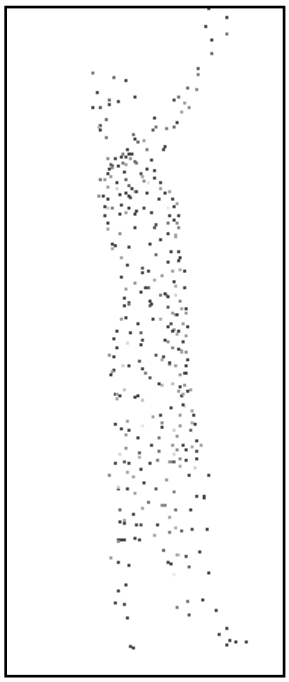
The scanning process was divided in two phases: the scanning of the tree itself, and the scanning of the apple-picker. The two scans generated were assembled in a post-processing software afterwards. The trunk and the main branches of the tree were first scanned, directly at the orchard. Later, the small branches as well as the leaves were scanned and added to the digital file of the tree in a realistic fashion. A dozen small branches as well as a dozen different leaves were scanned to recreate the tree as it was, standing in the orchard. As for the apple-picker and her basket, the scanning had to be performed on several different occasions, with a focus on one specific section each time.



SCANNING A HUMAN BEING

The first step was to cover the model with targets from head to toes, increasing the number of targets affixed to strategic areas with more curves, such as the legs and the arms. Approximately 500 targets have been used for the apple picker. After that, the position taken by the model had to be decided, and acquire the most targets possible with the Handyscan 3D laser scanner. Once the model's "skeleton" saved, the body parts were scanned one by one and positioned onto the skeleton. The model did not have to hold the pose during the whole scanning process. By marking on the floor the position of the feet and by drawing a point to stare at on the ceiling, the model could easily resume the pose whenever needed.

Once all the body parts were scanned and aligned on the skeleton, it was time to



move to the scans refining step. The work involved closing all the gaps in order to create a watertight model. This way, the work of art could be create by rapid prototyping. This step was the most time-consuming of all, and the fruit basket certainly proved hard to get! Finally, the team used a simple photograph to do the eyes and the hair, that they wrapped onto the face.

THE CHALLENGES OF SUCH UNBELIEVABLE PROJECT

The main challenge was the complexity of the object to scan. The shapes were very "organic" and hardly compatible with the conventional data treatment process. One of the major task was to align the 90 partial scans forming the tree trunk, the branches, the apple-picker and her basket. This complexity also impacted the volume of the resulting file. In order to open the file on the existing computer resources, it had to be greatly decimated, since the raw model presented 50 millions triangles and would have been too heavy to open. Once assembled, the final model was still quite heavy to handle, so the shots in the video were created following the "stop-motion" technique, one image at a time.

HOW THE HANDYSCAN 3D SCANNER WAS HELPFUL

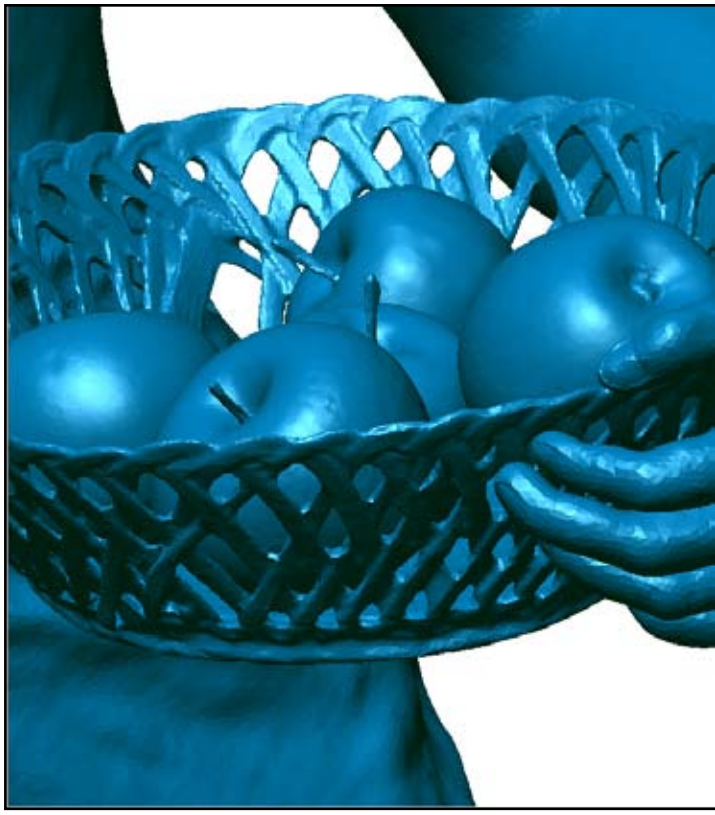
If it had not been for the 3D self-positioning handheld laser scanner from the Handyscan 3D line-up, the project would have been downright impossible to carry out! The scanner was flexible and portable enough to meet the unusual demands of such scanning project. With this scanner, the team was able to acquire quickly the main parts of the tree, and to get a lot of details where needed (on the leaves as well as for the apple-picker, particularly the basket she is holding). Given the thinness of a leaf, one might think that it is enough to scan only one side of the leaves, but this would be underestimating the team's care of details: indeed, each leaf was scanned on both sides, in order to create a 3D, watertight model.

The Handyscan 3D scanner was the only device on the market that allowed the team to reach its goals. Its self-positioning feature allowed for scanning in unconventional environments, through the branches and leaves. The team did not have to worry at all about the reach of the scanner's positioning system. With a system this portable, the

team was able to quickly do the acquisition in a variety of settings (in the orchard, in the lab, etc.)

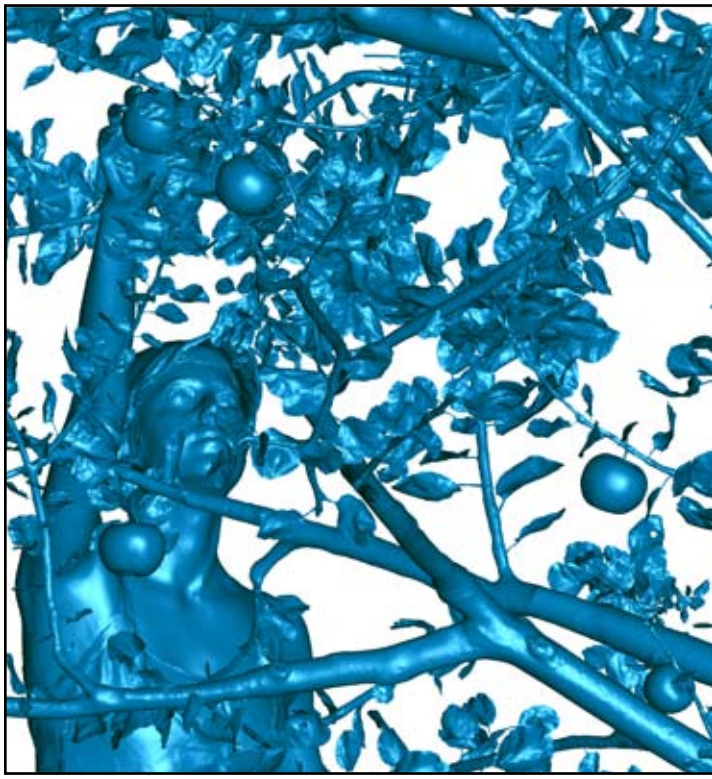
The Handyscan 3D scanner delivered good resolution where needed it and had the ability to scan the large objects while keeping details on the small parts, but most important of all, it is its true portability that made this project so successful. Moreover, the scanner can be -and was - used in a variety of settings, especially in the orchard, no matter the weather or wind conditions!

The Handyscan 3D scanner is as simple as it can be. Upon the arrival in the orchard, the team was set up and acquiring data in a couple of minutes. The VxScan data acquisition software, exclusive to Creaform, also allowed for quick data acquisition and reduced the time spent on the field.



THE GRAND FINALE

The final video is an absolute mind-blower. Forget the static, mute .stl file. What unrolls before your eyes is a video artwork featuring a rather improbable combination: high technology and nature. After watching this video, one question immediately comes to mind: is there really a limit to where 3D scanning will lead us?



To watch this amazing video, visit
http://www.creaform3d.com/en/handyscan3d/contest/fruit-of-the-4-elements.aspx.