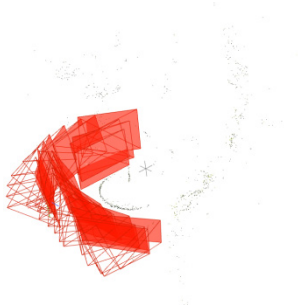
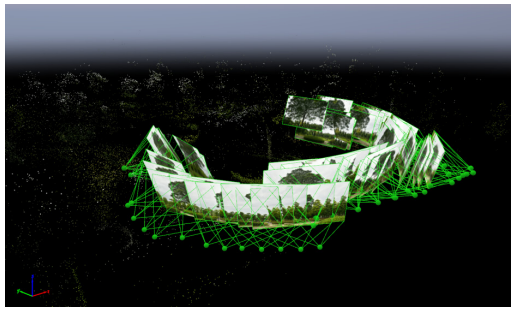
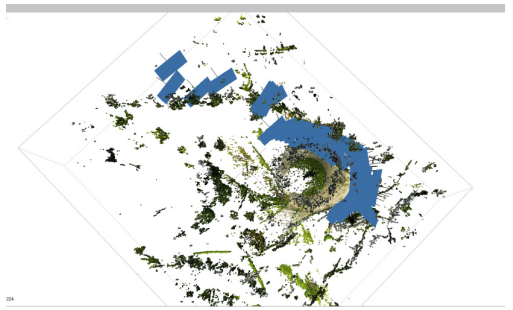
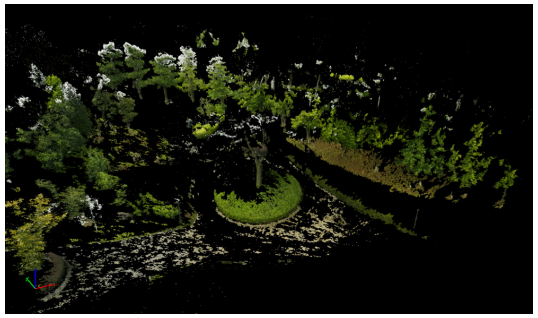
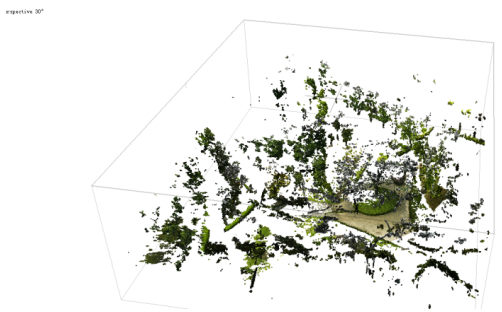
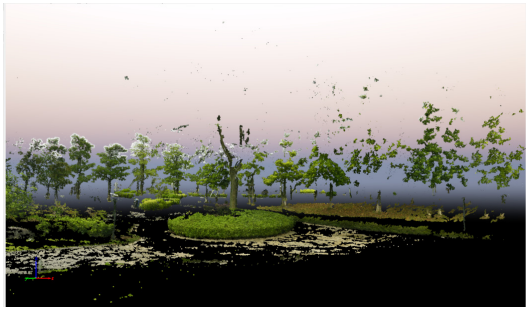
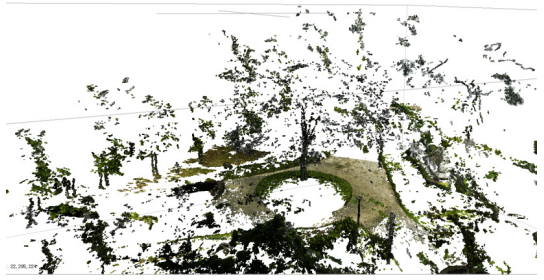
COLMAP Pix4Dmapper Metashape comparisons for tree images processing

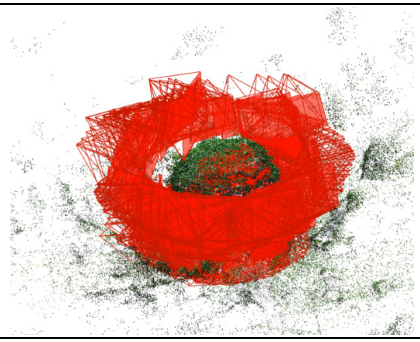
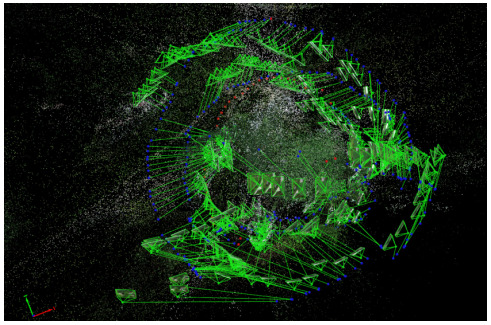
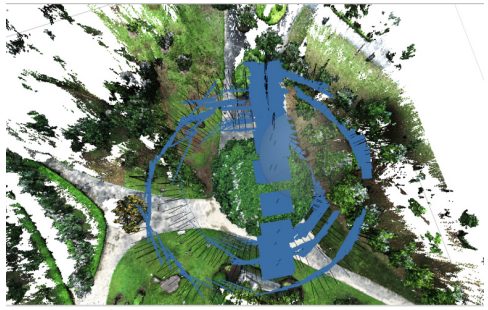
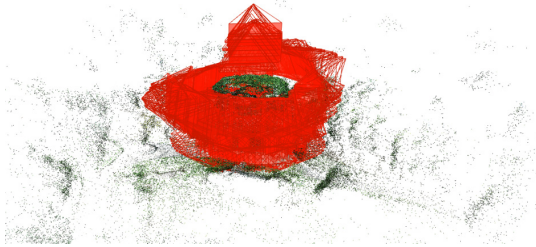
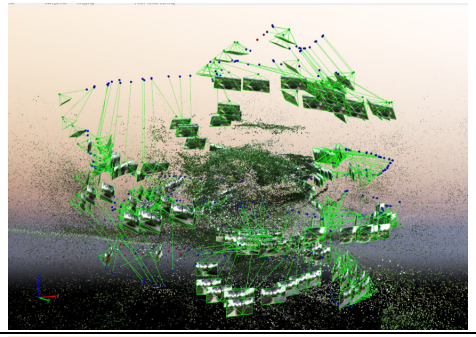
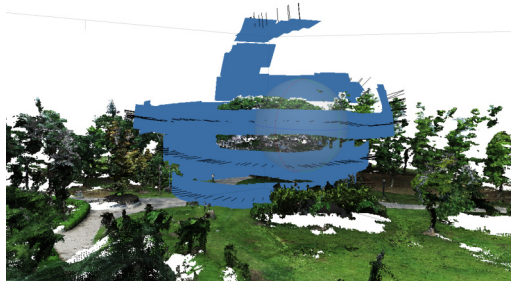
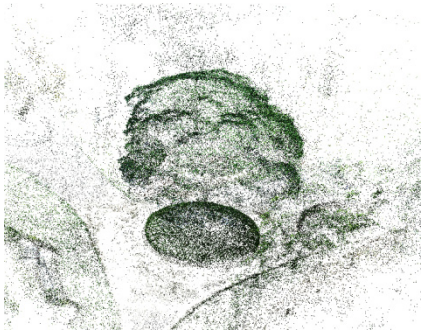
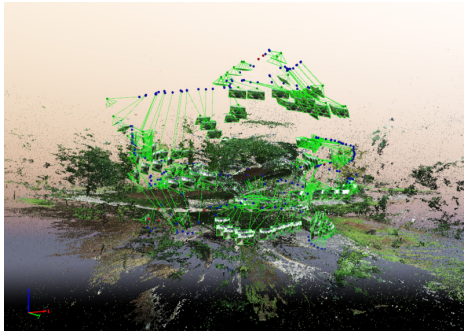
We present the photogrammetry reconstruction results of two image datasets of Trees_2 using three different software programs: COLMAP, Pix4Dmapper and Metashape.

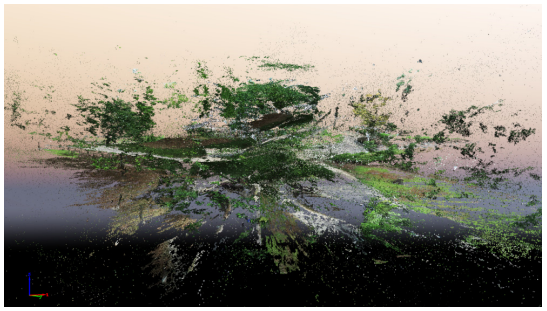
A. Nikon image dataset: 107 images taken around the tree. About 67 image calibrated (their positions and orientations determined after the SfM step).

Tree_2 Nikon images	**COLMAP**	**Pix4Dmapper**	**Metashape**
Image block after SfM			
Dense reconstruction result: View 1			
Dense reconstruction result: View 2			

From the above results, COLMAP performs as well as, or even better than other commercial software programs. The latter two failed to reconstruct the tree crown.

B. UAV image dataset: 374 Photos were taken around the tree on the ground, at different heights in the air and flew across the tree.

Tree_2 UAV images	COLMAP	Pix4Dmapper	Metashape
Image block after SfM: View 1			
Image block after SfM: View 2			
Dense reconstruction result: View 1	 No dense reconstruction (The program crashed. Shown sparse points only)		

Dense reconstruction result: View 2	No dense reconstruction (the program crashed)		

We can visually determine from the above case of UAV images, Metashape performed the best, while COLMAP crashed in the MVS densification step, its SfM result was also good enough to reveal the whole image block and sparse points of the tree. Pix4Dmapper mishandled the images.

In conclusion, from the above comparisons and analysis, we found that COLMAP is a versatile open-source photogrammetry tool that can process images and generate reliable 3D reconstruction results that are as good as those produced by commercial software in most cases.