The original algorithm ('MON') has been published in CMRT 2013:

M. Awrangjeb and C. S. Fraser, "Rule-based segmentation of LIDAR point cloud for automatic extraction of building roof planes," ISPRS Annals of the Photogrammetry, Remote Sensing and Spatial Information Sciences, Volume II-3/W3, 2013 Pages 1-6 CMRT13 - City Models, Roads and Traffic 2013, 12 – 13 November 2013, Antalya, Turkey.

Link: http://www.isprs-ann-photogramm-remote-sens-spatial-inf-sci.net/II-3-W3/1/2013/isprsannals-II-3-W3-1-2013.pdf

The only difference between this modified algorithm and the original algorithm i.e., 'MON' is how the planar boundaries have been extracted. While in the modified algorithm the LIDAR points around the boundary of a planar segment are used (Method 1 below, Fig. 1b-c), in 'MON' the Canny boundary has been used (Method 2 below, Fig. 1d-e).

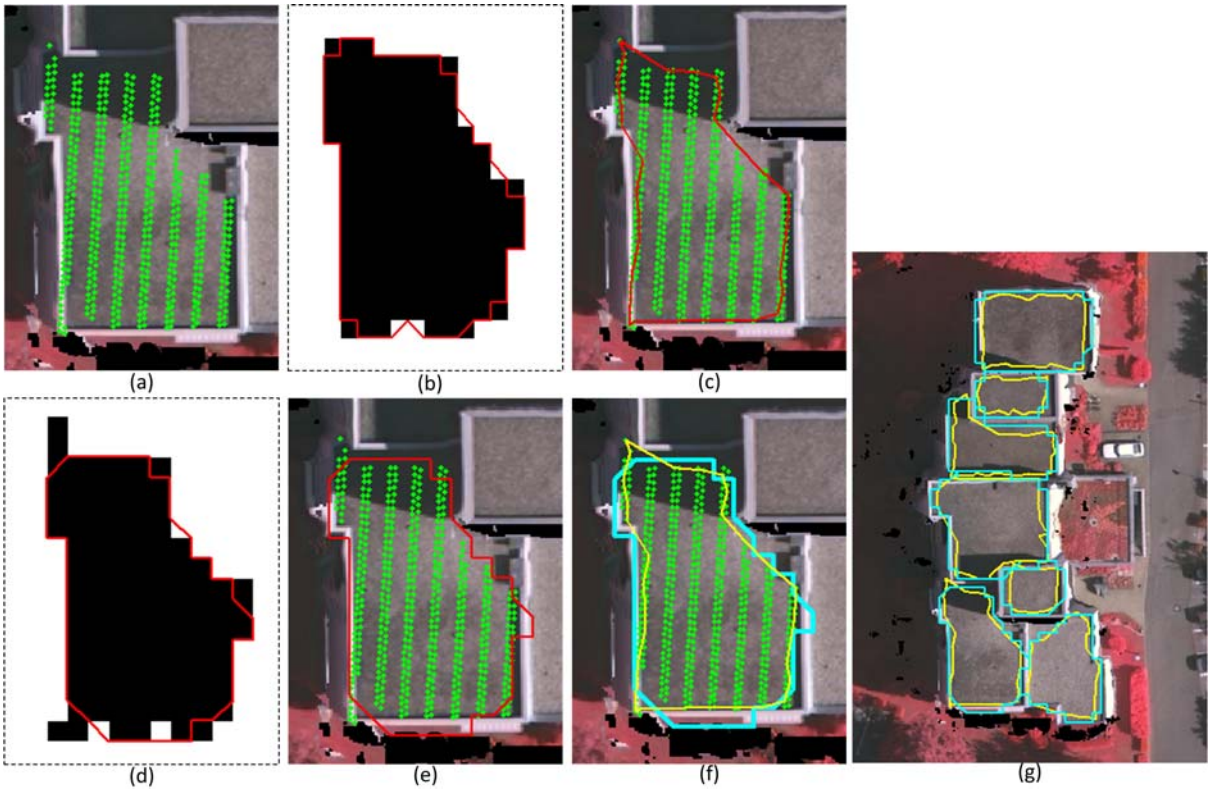

Fig. 1: Extracting a plane boundary in two different methods: (a) LIDAR points on the plane, (b) Canny edge around a mask of resolution 1m, (c) boundary after assigning nearest LIDAR points to boundary in (b), (d) Canny edge around a mask of resolution 0.25m, (e) boundary after assigning only height values from nearest LIDAR points to boundary in (d), (f) comparing two extracted boundaries, (g) two types of extracted boundaries on the whole building roof.

Method 1: LIDAR points on a planar segment are shown in Fig. 1a. Using the LIDAR points on the plane, the first method initially forms a binary mask of resolution 1m (or same as the maximum LIDAR point-spacing) as illustrated in Fig. 1b. This method then extracts a Canny edge around the black shape in Fig. 1b and assigns the nearest LIDAR points to the edge points. Fig. 1c shows the extracted plane boundary.

Method 2: The second method generates a slightly different mask of resolution 0.25m (or same as the maximum LIDAR point-spacing) as shown in Fig. 1d. It then extracts a Canny edge around the black shape and assigns only the heights values from the nearest LIDAR points to the edge points. Fig. 1e shows the extracted plane boundary using the second method.

Figs. 1f-g shows the two extracted boundaries on test building. On average the area difference between the two extracted boundaries in Methods 1 and 2 is between 7 to 9m^2 for the Vaihingen data set.