



# **Identification and Location Derivation of Grapevine Features through Point Clouds**

**BY**

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## Declarations

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# Publications

## Conference:

Di Gao, Tien-Fu Lu and Steven Grainger, 'Post Identification and Location Derivation in Vineyards through Point Clouds using Cylinder Extraction and Density Clustering', *2013 IEEE Conference on Robotics, Automation and Mechatronics (RAM)*, 11-14, Nov, 2013, Manila, Philippines.

## Journal:

Di Gao, Tien-Fu Lu and Steven Grainger, 'A New Method of Feature Extraction and Location Derivation in Vineyards using Point Clouds', *Applied Engineering in Agriculture*, 30(2): 293-306.

## **Abstract**

An automatic pruning machine is desirable due to the limitations and drawbacks of current labor intensive grapevine pruning methods. Automation mitigates the issue of skilled worker shortages and reduces overall labor cost. To achieve autonomous grapevine pruning accurately and effectively, it is crucial to identify and locate some key features including post, trunk, cordon and cane in order to open/close the cutter and adjust the height of the cutter appropriately. In this thesis, a new method is proposed to automatically identify these features and derive their locations using point clouds. This method combines the advantages of cylinder extraction, density clustering and skeleton extraction for identification purposes. More importantly, it fills the gap of non-uniformed feature extraction in vineyards using point clouds. The results of applying this method to different data sets obtained from vineyards are presented and its effectiveness is demonstrated.



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