



# Fast Counting Method of Soybean Seeds Based on Density Estimation and VGG-Two

Ying WANG<sup>1</sup>, Yue LI<sup>1</sup>, Tingting WU<sup>2</sup>, Shi SUN<sup>2</sup>, Minjuan WANG<sup>1\*</sup>

1. *Key Laboratory of Modern Precision Agriculture System Integration Research, China Agricultural University, Beijing 100083, China;*
2. *Institute of Crop Sciences, Chinese Academy of Agricultural Sciences/Ministry of Agriculture and Rural Affairs Key Laboratory of Soybean Biology, Beijing 100081, China*

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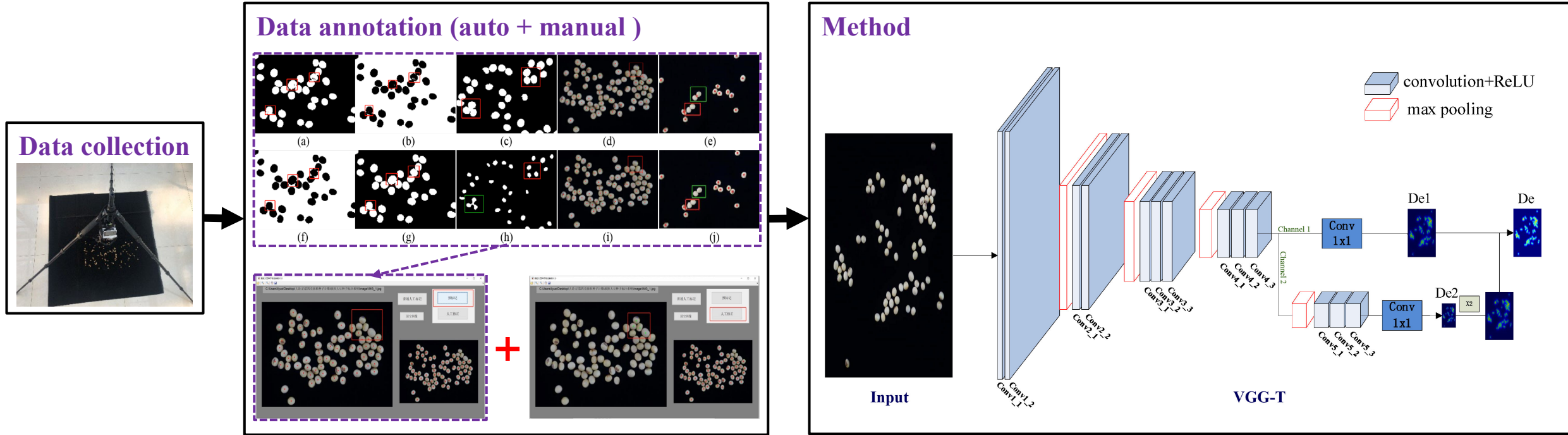


**China Agricultural  
University**

# Ying WANG

Key Laboratory of Modern Precision Agriculture System Integration Research, China Agricultural University, Beijing 100083, China;

In order to count soybean seeds quickly and accurately, improve the speed of seed test and the level of soybean breeding, a method of soybean seed counting based on **VGG-Two (VGG-T)** was developed in our research. The overall process is shown in the figure.



Methods	Patch	MAE	MSE
Traditional morphological operations	✗	4.36	7.17
ResNet18	✗	2.1	2.4
	✓	0.7	0.8
VGG16	✗	2.2	2.9
	✓	0.4	0.6

Methods	Patch	MAE	MSE
ResNet18-T	✗	0.7	0.8
	✓	0.2	0.3
VGG-T	✗	0.6	0.6
	✓	0.2	0.3

As shown in the table, compared with traditional image morphology operations, ResNet18, ResNet18-T and VGG16, the method proposed improving the accuracy of soybean seed counting.

**Contact Information:** wyleo@cau.edu.cn