

Semi-Automatic Plot Extraction Using Image Segmentation

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Abstract

Plot extraction for field trials plays a foundational role in supporting various research and development related to agricultural applications, including the classification of crop types, estimation of crop yields, and monitoring the health of crops. Traditional methods employed to define these plots have a trade-off between the substantial human labor involved and the precision of the delineated plots. In our research, we introduce a semi-automatic framework for plot extraction that requires only two essential inputs: the width and height of the plot. Our framework leverages the Segment Anything Model (SAM) for image segmentation, producing masks that are subsequently converted into polygons. These generated polygons are then filtered based on the user input. We refine the positions and orientations of these polygons by maximizing their overlap with the actual plot field. Experiment results were evaluated by comparing the extracted boundaries with manually digitized ground truth data. The results of our study demonstrate the successful extraction of individual plots across various fields characterized by diverse crop types. It is our expectation that this framework will significantly reduce the manual labor required for precise plot extraction, thus enhancing the ease and efficiency of this critical prerequisite task.

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