

Ensemble Neural Networks and Image Analysis for On-Site Estimation of Nitrogen Content in Plants

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Abstract	<p>In agricultural practices, the estimation of nitrogen content in plants is an essential aspect to be considered, especially to support precision farming. In this paper, a combination of backpropagation neural networks and committee machines to estimate the nitrogen content in wheat leaves has been proposed. The leaf images were captured under sunlight by means of a conventional digital camera. In this proposed method, features fusion of three color spaces, i.e. RGB, HSI and CIE-Lab, is introduced as the input parameters for the nitrogen prediction. In the image segmentation, neural network is utilized to differentiate the leaves from other surrounding parts. The results of the proposed method are much better than that of the SPAD meter, as well as the linear regression analysis and single neural network based estimation methods.</p>
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