

TEKNIK PENGOLAHAN CITRA DIGITAL UNTUK PENDUGAAN KADAR AIR TANAH LAHAN KERING DENGAN PENANGKAP CITRA INFRARED WEBCAM

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Abstract	<p>Moisture content is one of important soil characteristics in agricultural systems and is often needed to determine other soil characteristics. Gravimetric method is widely used to measure soil moisture content. Although the result is quite accurate, however it is very time consuming. In this research, soil moisture content of arid field has been analyzed by image processing method using webcam and infrared webcam as the image-captured devices. This research aimed to estimate soil moisture content from images captured by webcam and infrared webcam and to define the most appropriate visual properties as the soil moisture content prediction parameter. Soil samples used in this research was from arid field of Gunung Tugel Village Banyumas Regency. Thirty samples of arid field soils were collected using soil ring samplers in 5 cm of soil depth. All samples were wetted until they reached a saturated condition. After that, the samples were stored for 30 days under room temperature condition until the soils became dry. Everyday the weight of each soil was measured and the images were captured by using webcam and infrared webcam. The images were then extracted by using image processing to obtain visual parameters such as RGB index as well as HSI colour and texture feature. Each of the visual parameters was then determined its correlation with soil moisture content and the R² of the correlations. The final step of the analysis was calculating the mean percentage error (MPE) of the moisture content estimation. A visual parameter which has the least MPE would be used as the prediction parameter. The results of this research showed that soil moisture content of arid field could be predicted by using visual parameters from images captured by webcam and infrared webcam. Intensity of the soil images captured by infrared webcam resulted prediction error lower than that by webcam.</p>
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