



Accurately measuring volume of soil samples using low cost Kinect 3D scanner

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The 3D scanner of the Kinect game controller can be used to increase the accuracy and efficiency of determining in situ soil moisture content. Soil moisture is one of the principal hydrological variables in both the water and energy interactions between soil and atmosphere. Current in situ measurements of soil moisture either rely on indirect measurements (of electromagnetic constants or heat capacity) or on physically taking a sample and weighing it in a lab. The bottleneck in accurately retrieving soil moisture using samples is the determining of the volume of the sample. Currently this is mostly done by the very time consuming "sand cone method" in which the volume were the sample used to sit is filled with sand. We show that 3D scanner that is part of the \$150 game controller extension "Kinect" can be used to make 3D scans before and after taking the sample. The accuracy of this method is tested by scanning forms of known volume. This method is less time consuming and less error-prone than using a sand cone.