tech notes beach

Image Collection for Material Samples

This document details the procedure for collecting material sample images that can be used to train a deep learning network to automatically determine grain size distribution from an image. These procedures follow the USACE recommendations for the *Citizen Science* project (*https://cirp.usace.army.mil/workunits/citizen_beach.php*).

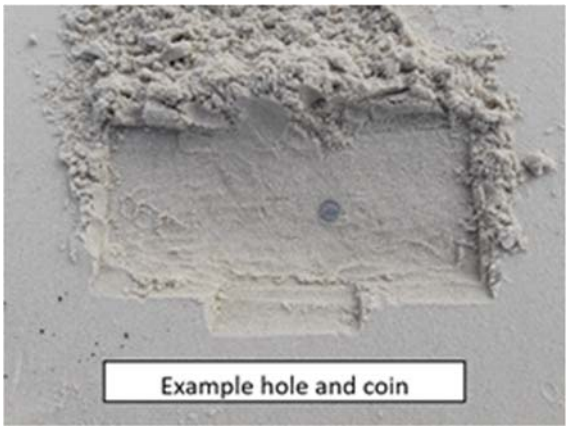
The most important part of developing any deep learning network is collecting the data (no matter how good your model structure, it can't learn anything without good data!). We are already doing the work of collecting samples and testing their respective grain size distributions, therefore we might as well take a picture and see what we can build over time.

**Note: This process is only relevant for samples we are sending in for laboratory testing.*

Procedure

1. Before taking your beach sample:
    a. scrape the top 1/2-inch from the surface of the beach
    b. pat the sand down to create a smooth bottom within the depression

    It is important that the surface to be photographed is smooth and either dry or drained. Images of very wet sand will not show individual grains as well and will likely have to be discarded.



2. Ensure the material in the image is representative of the material that will be sampled.
3. Place a US coin in the hole for scale and pull out your camera phone.

    Rulers work as well, as long as it is clear what the scale is (effectively we just need a way to determine mm/pixel).
4. Take photos of the sand with the coin on the side of the image (see next page)
    a. The coin should take up 10-20% of the image (phone approx. 4-8 inches to the ground)
    b. Ensure camera is parallel with the ground
    c. Try to keep any shadows out of the image
    d. Ensure camera is in focus → tap screen for auto focus or adjust settings manually for better focus
    e. Higher quality image and/or camera produces better results
5. After images have been taken, follow standard sampling procedures
    a. Sample from the top 2-3 inches (or more) of sediment in the hole
    b. Bag the sample and label appropriately
    c. Send material in for testing
6. When results come back, e-mail the following to wsayer@gldd.com:
    a. Sample test results – include any info that came with the test (grain curves, tables, etc.)
    b. Full Image of the material – include *project number* and *sample name* in the filename

Quality is key here. If an image is too blurry or doesn't follow the guidelines, we may not be able to use it. However, when we get a good image, it can be split into 6-10 sub-images to be used for training!

Feel free to send multiple at a time in a .zip file (say at the end of a project), as long as there is a way to match images to results. Any and all contributions to this project are much appreciated!

Sample Images