

State of the Art



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“Recent Advances and Innovations in Optical Geo-Characterization”

ABSTRACT: With exponential increases in digital camera resolution, the last 10 years have witnessed major advances in the use of image analysis in geotechnical engineering. The lecture will review the history of photography and image analysis in geotechnical engineering. It presents a database of numerous references describing the use of image analysis in site characterization; earth mass characterization; particle characterization; motion and deformation. The presentation then focuses on development of image analysis hardware and software systems for determination of intrinsic soil properties such as particle size and shape distributions. The test systems include the Translucent Segregation Table (TST), Sedimaging, the Vision Cone Penetrometer (VisCPT), Stereophotography, Optical Flow and Digital Microphotography. The lecture concludes with presentation of new statistical relationships between intrinsic soil properties as determined by image analysis and mechanical behavior of soils.