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Cellular-phone-based computer vision system to extract shape properties of coarse aggregate for asphalt mixtures

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Abstract: A new computer-vision cellular-phone-based methodology and scheme was developed to determine the shape properties (Flatness Index, Elongation Index and Roundness Index) of coarse aggregate particles. This scheme utilizes cellular phones images and image processing techniques (IPT) in determining the coarse aggregate particles shape properties. This methodology compared with the conventional methods, which need special laboratory technicians and are time consuming was faster and more accurate procedure. Fifty coarse aggregate particles were collected and their shape properties were measured manually (using caliper and AutoCAD) then computed using image processing procedure. To compute these shape properties using image processing , special data acquisition method was designed and implemented. The aggregate particles were arranged on a grid of an apparatus designed specifically for this task, and mapped by the cellular phone from two views; top view and side view. Then cellular phones images were analyzed with ImageJ software.