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Analysis of close range laser scanning data of gravel fields

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Close range laser scanning can be performed with triangulating laser scanners, using the principle of light section, and laser scanners observing the distance from sensor to object directly. For very short distances (up to 1m), the light section principle can provide higher accuracy, whereas distances up to a few tens of meters are best observed with scanners employing the phase-shift technique. Triangulating laser scanners can provide precision of about 0.5mm, whereas phase-shift scanners provide 2mm accuracy (std.dev. in each coordinate). Data acquisition over larger areas is only feasible with scanners observing the range directly.

The overall aim of the approach presented is to derive the correl size distribution of a gravel field automatically. The initial investigation, presented here, leads to the understanding of the measurement technology over these targets and its principal suitability. An automatic method for the detection of individual gravel stones is presented. It is based on trend removal and maxima detection.

The identified number of gravel stones in a photographic image, a light section scan, and a phase-shift laser scan are compared. The latter results are achieved manually as well as automatically.