



## Shape descriptors to characterize the shoot of entire plant from multiple side views of a motorized depth sensor

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Mots-clés	Depth image [7], Fractal [8], image analysis [9], Kinect [10], Phenotyping [11], Plant shoots [12], Shape descriptor [13]
Résumé en anglais	<p>A low-cost depth camera recently introduced is synchronized with a specially devised low-cost motorized turntable. This results in a low-cost motorized depth sensor, able to provide a large number of registered side views, which is exploited here for the quantitative characterization of the shoots of entire plants. A set of four new shape descriptors of the shoots, constructed from the depth images on multiple side views of the shoots of plants, is proposed. The four descriptors quantify effective volume, multiscale organization, spatial symmetries and lacunarity of the plants. The four descriptors are here defined, validated on synthetic scenes with known properties, and then applied on nine different-looking real plants to illustrate their abilities for quantitative characterization and comparison. The resulting motorized depth sensor and associated image processing open new perspectives to various plant science applications including plant growth and architecture monitoring, plant response to stresses or the assessment of aesthetic parameters for ornamental plants.</p>
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