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Genetic algorithm for the optimization of vision acquisition for on-the-fly position measurement of individual layers in fuel cell stack assembly

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Abstract

Polymer electrolyte membrane (PEM) fuel cells consist of hundreds of stacked individual layers. As misplacement can lead to product-malfunctions the positioning accuracy plays a crucial role during assembly. Thus, to increase accuracy and to lower the cycle time, this paper presents a camera-integrated gripper for single layer handling of fuel cell components. The overlapping of suction holes within a gripper system is used for position measurement of fuel cell layers. The hole pattern is optimized applying a genetic algorithm to precisely measure the position of individual layers.

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