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An Outline of a Complementary Inspection System for Micro-Electro-Mechanical System (MEMS) Devices Based on Radiography and Plenoptic Camera

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Abstract. In the last decades, micro manufacturing was driven by micro-electro-mechanical systems (MEMS), where well-established manufacturing methods based on semiconductor technologies are able to produce structures in miniscule dimensions. Often, such modern electronic devices offer high level functionality in reduced space. However, such components may be impaired in several ways during fabrication and assembly stages resulting in damages or/and structural failures. To enable inspection of MEMS components, new technologies are needed to ensure reliable quality control in particular in medical/aerospace industries where 100% quality inspection is required to achieve highest safety standards. In this paper, an outline of the inspection system architecture that can be applied to inspect MEMS component during the production phase using plenoptic camera, x-ray and associated image processing techniques will be described. The inspection system aims to achieve an autonomous, reliable and accurate solution to reduce the production costs.

Keywords. X-ray, light field camera, robotic manipulation, image processing, MEMS, non-destructive testing (NDT).

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