SDU 🎸

International

Elite Summer School

in Robotics & Entrepreneurship



INDUSTRY CASE

Odense - Denmark 🗰 Aug. 5th to Aug. 23rd 2025

#09_LEGO_D Scratch anomaly detection

Context

At the LEGO group, our bricks are primarily created through the process of injection moulding. This ensures a precise and clean product after just one process. However, some of our elements require a post processing procedure, like printing, to ensure the highest level of quality and detail. To enable the printing process, it is crucial to constrain the elements in custom jigs, to guarantee that the prints are correctly aligned and printed.

In some cases, we also try to identify if any scratches are present on the elements. Currently this process is entirely done manually.



Challenge

Develop a vision application to identify general scratches on different element.

A physical test setup is supplied with lights and cameras.

A set of test elements are supplied along with reference images. To validate that the solution can detect scratches in general, a secret set of elements are revealed at the start of the physical Hackathon.

The Supplied elements are all the same colour, but the best solution should be able to handle several colours as well.

Tools, methods and materials

- Documentation of all the equipment
- Annotated reference images
- The physical test setup

Ideal outcome for the company

We are clueless in terms of detection of scratches. Any input on this matter of detecting scratches on elements are very welcome.



We are the company behind the bricks and have been sparking children's imaginations since 1932. Today, we transform our factories through Automation and Robotics, delivering productivity and an exiting workplace, where skilled colleagues play key roles as problem solvers and innovators. We ensure LEGO manufacturing equipment has the latest Operational Technology and Robotic features and through Al/ML/Simulation enabling a cyber secure, efficient production with reduced lead-time and cost savings.

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