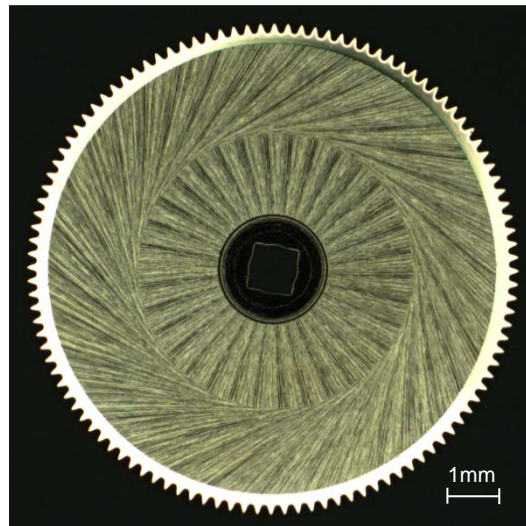


# APPLICATION NOTE

## Watch Part Inspection



### CHALLENGES IN AUTOMATED INSPECTION OF DECORATED WATCH PARTS

- Surface decorations come in many different types and variants as well as on numerous types of materials.
- The production processes (manual or automated) are designed to reveal a random aspect which makes each part unique.
- There are many different types of defects which often manifest themselves not just by a local change in contrast, but a change of the local texture.

With ViDi Suite and the ViDi red tool, the automated analysis of decorated watch parts is now extremely simple.

The software algorithm trains itself on a representative set of annotated images as well as known good samples. The learning system automatically incorporates contextual information in order to form a reliable model of the part's shape and decoration. As a consequence, difficult to discern defects can be detected as in the sample to the side: the two scratches are considered as anomalies because they have an orientation which deviates from the expected average local orientation of the decoration.



#### VIDI SUITE

Deep learning based industrial image analysis software for automated inspection and classification

**Human-like:** Outperforms the best quality inspectors

**Self-Learning:** No software development required

**Powerful:** Tackles the impossible to program inspection challenges

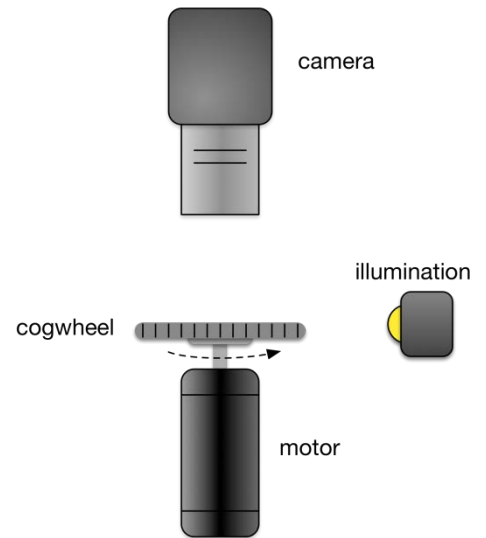
#### HOW DOES IT WORK?

It is as simple as 1-2-3:

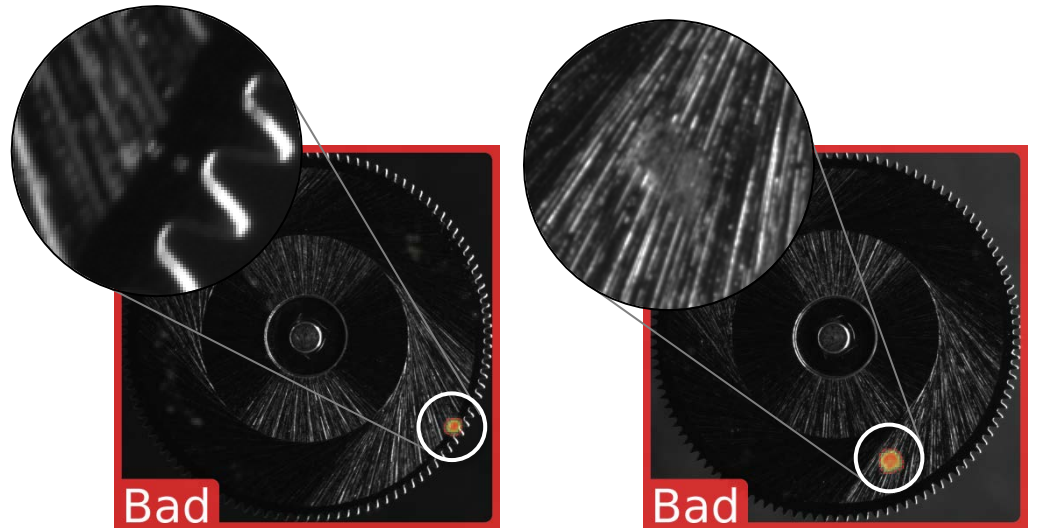
- 1- Collect images of "known good parts"
- 2- Let ViDi Suite train on those samples and create its reference model
- 3- Proceed with testing

## IMAGE ACQUISITION SETUP

One of the key challenges when inspecting decorated watch parts is that typical defects like scratches or dents are only visible for some specific combinations of camera position, part surface orientation and illumination angle. In order to increase the probability that these combinations are found, the cogwheels are placed on the axis of a motor and rotated continuously in front of the camera next to a spot-like low-angle illumination. The resulting sequence of images reveals the different defects which often manifest themselves as changes in local texture.



## SAMPLE DEFECTS



## INTEGRATION

Due to its self-learning abilities, ViDi Suite can be deployed quickly and easily on new applications without the need for any specific development

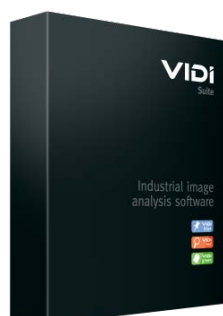
## RESULTS & PERFORMANCE

**Powerful Detection:** Various types of defects on complex decorated watch parts can be reliably detected.

**Self-Learning:** The inspection of the decorated surfaces was conducted without the need for a multitude of carefully tuned and optimized detection algorithms, but instead relied on a human-like approach - learn and apply - topped with an improved testing consistency and repeatability.

**Quick & Easy:** Learning from the representative set of samples can be achieved in less than 30 minutes.

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# VIDI