

# APPLICATION NOTE

## Aesthetic Textile Inspection



### CHALLENGES IN TEXTILE INSPECTION

- The fabric pattern can be highly complex, and position variants can preclude the use of simple methods based on spatial frequency analysis
- The visual appearance varies drastically: deformations due to the stretchable nature of the fabric and other variations such as yarn thickness.
- Defects in textiles come in countless forms and types and explicitly searching for all defects is not an option.

### 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

With ViDi Suite, the automatic inspection of complex pattern fabrics is now extremely simple.

The software algorithm trains itself on a set of known good samples to create its reference model.

**No tedious software development is required!**



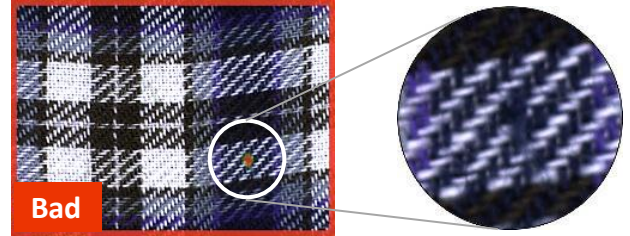
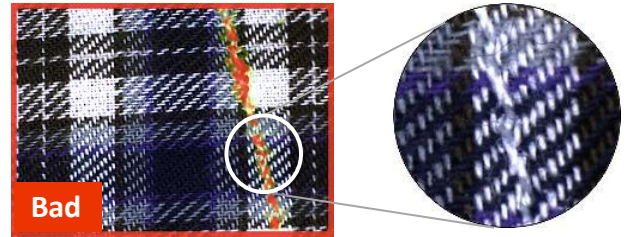
Once this training phase is completed, the inspection is ready to go. Defective areas of the fabric can quickly be identified and reported. Best of all, there is **no need for extensive defect libraries!**

## YARN DYE PLAID

For this first woven fabric, we provided our ViDi red tool with a representative set of good samples for the system to learn by itself, completely unsupervised, the weaving pattern, yarn properties, colors and tolerable imperfections.

After the training phase was completed, the inspection was able to quickly identify defects like the ones shown at the right.

Top: Unexpected stitching  
Bottom: Weaving weft float

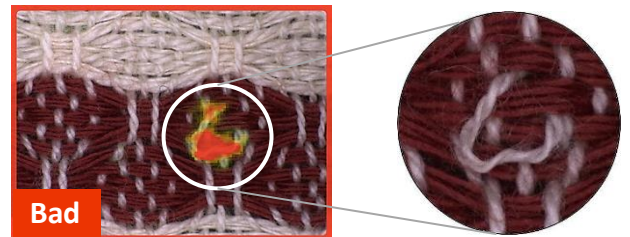
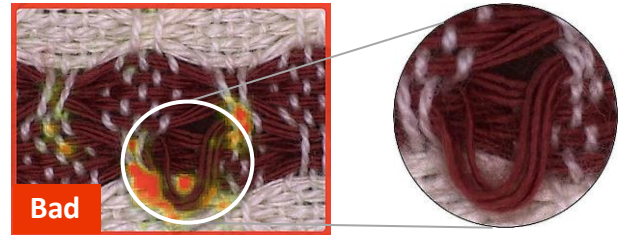


## YARN DYE STRIPES

On this second set of fabric, just as for the previous set, ViDi's red tool learns, by itself, a model of the complex knitting pattern from a collection of randomly selected good samples.

During the inspection phase, the red tool reports defective areas of the fabric like the ones shown at the right:

Knitting loops in warp and weft



## 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

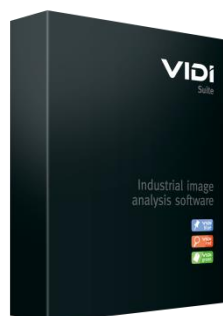
This novel approach brings human visual inspection performances to automatic textile quality control equipment. It radically differs from traditional Machine Vision solutions since it is:

**Self-Learning:** Textile inspections were conducted without involving any pre-defined defect library. Instead, the system learns all by itself, completely unsupervised, the weaving pattern, yarn properties, colors, and tolerable imperfections.

**Human-like:** It outperforms the best quality inspectors in term of accuracy, testing consistency, and speed.

**Powerful:** In both cases, learning from the known good sample was achieved in less than 10 minutes. Most types of textile manufacturing defects can be identified at each stage of textile processing (ginning, spinning, cutting, weaving/knitting, pretreatment, dyeing/printing, finishing, and stitching).

ViDi Systems SA  
Zone Industrielle du Vivier 22  
1690 Villaz-St-Pierre  
Switzerland  
T. : +41.26.653.7230  
F. : +41.26.653.7231  
sales@vidi-systems.com  
www.vidi-systems.com



# VIDI