



Fig1. Example of product clustering and planogram compliance checking.

# **REPLANO** REVERSING SHOPVIEW ANALYSIS FOR PLANOGRAM

## Context

With the increasing care of retail shop owners in improving sales and costumer experience, there is a need to develop technology in order to optimize their goals. It's proven that a planned product placement (planograms) can boost sales and improve costumer experience.

With this in mind, Fraunhofer Portugal came up with the ShopView solution to help retailers extract, validate and manipulate planograms from highresolution images of the real shelves in the store. In this sense, this work focused on the creation of a solution using computer vision algorithms and OCR (Optical Character Recognition) to extract information from high resolution images of retail shelves taken with the ShopView solution.

# Motivation

The most common solutions available on the market are mainly focus to only design the planogram manually. Some solutions that automatically create and validate the planograms from real shelf images are emerging but they are not always a true complete and autonomous solution.

With the correct products recognition from the shelves images (and their keywords), ShopView can build the planogram without the need of manually creating it in software, this is especially helpful for small retail shop owners since they don't always have access or knowledge to use the

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# Recognition Process

On the Fig2. we can have an overview of how the algorithm works. It starts by searching the areas with products using feature detection, then it searches for text in the areas of products and recognizes it. Finally it segments the products and matches the same segments of text (products of the same time). On this example, the clusters of keywords detected are: {"Amêndoas", "CEREAIS INTEGRAIS", "375g"} and {CARAMELO &

#### **Project Keywords**

Image Processing

CHOCOLATE}.

- OCR
- Feature Extraction
- Segmentation
- Text Extraction
- Clustering

#### **Future Work**

The continuation of the development of this solution will pass mainly by the integration of the output of the algorithm in ShopView and should be developed a more reliable option to the text detection of the artistic fonts and the respective recognition.



Fig2. Recognition Process.

available solutions of planogram creation.

The use of OCR can bring additional information about the items. Having the ability to create a planogram from the images based on the products keywords.

### Advantages

This solution is a better alternative regarding to the most common implementations (using deep-learning) because this approach doesn't need a large and constantly updated database of images (for the leaning). Also, it has immunity to product package and appearance changes and the ability to distinguish products with minimal differences between them. These characteristics are especially important to the real-world applications in terms of scalability and usability.

On the daily basis, the retailers receive products with constant appearance changes, the use of deep-learning techniques would be impracticable due to the constant required updates of the database for the template matching – having to take pictures of the products throughout the entire life.

The lack of a shared database between retailers of a country/market that centralizes the changes between products makes the deep-learning techniques impossible to support in terms of costs of operations and maintenance.



Fig3. Example of the use of the image projection to segment products.