Pattern Matching Application For Automation Processes Using Lab VIEW

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Abstract

Pattern matching is a versatile application of machine vision to find the exact location and other information while inspection and quality testing and assurance. The machine vision is so capable that it can store and manifest the use of versatile application into anapplication-based software. In this paper, a pattern matching application has been developed to assure the use of Vision assistant and Vision builder for assessing the use of artificial intelligence-based method to generate the morphological features to find significant role as smart assisted device. The design is inspired to provide the use of such application in robotic application and caption coordination calculations. The vision assistance is the core builder of this application which is presented in a methodological way to form such simple method for beginners.

Keywords: Vision assistant, Pattern Matching, Vision Builder, LabVIEW

1. Introduction

LabVIEW is a versatile software to develop many kinds of applications [1,2]. The third-party software and patches help the engineers and researchers to build various kind of application based Virtual instruments to assist the robotic and automation processes for sorting real and croc challenges in the industry line. The software is so capable that it can help a beginner to develop various modules and sub modules. The world of robotics is now expending to feet new horizons and breaking the limits of technology to expand the ore of methods [3,4]. The pattern matching is an application which is used in industry line for solution of many purposes. This application is so vast that it is replacing the human experts in various fields such as Vehicle number plate matching, Texture analysis for product quality such as tea, CCTV camera inspections, assembly lines for fault detection. The Vision builder, vision assistant and NI VISA is a tool to make this application. The software patches are required to make this application are provided by third party firmware [4,5,6]. VI Package manager is the main software tool to provide necessary patches for this task. The Makerhub patch is used for assisting the application to communicate with outer world communication. The list of components is used for this task to realistically working of pattern matching. Image processing is the mail pillar to do pattern matching. There are various kind of pattern matching tools to build like via Speech, video, image, symbolic and texture based. In all these, the image-based

processing is the main scope of applications due to attractive and dynamic behaviors. The features which are extracted for an image are more accurate and more usable for designing applications. From few decades, the pattern matching through soft computing methods is getting used for porch to machine vision enhancement. The given Figure 1 show the availability of patches is VI Package manager.

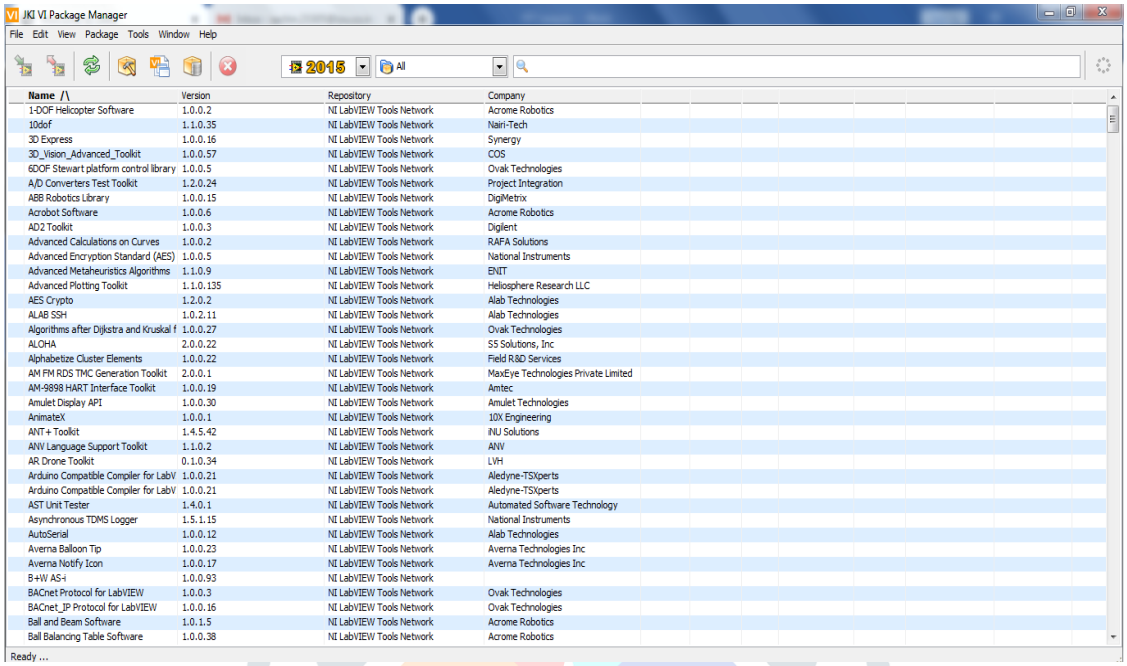

Figure 1: VI Package manager for Vision Assistant Module.

So, in this paper the methodology to develop pattern matching application has been discussed to build the Virtual instrument form [7,8,9]. The testing and validation are given in the methodology is getting inspired from various modules of papers [9,10,11].

2. Methodology

There are various modules are required to do image processing and building blocks to be installed in LabVIEW version. The compatibility is the main mode of checkout required for this application. The installation of such models is become a cumbersome task to do [12,13,14]. The following modules are given as

a) LabVIEW 2015
b) NI VISA 15.0
c) VI Package MANAGER
d) MAKERHUB
e) VISION Assistant 6.0
f) VISION builder 17.9

g) Tool Skool for formation of pallet

Figure 2 shows the block diagram of procedure and methodology to implement and state this application building.

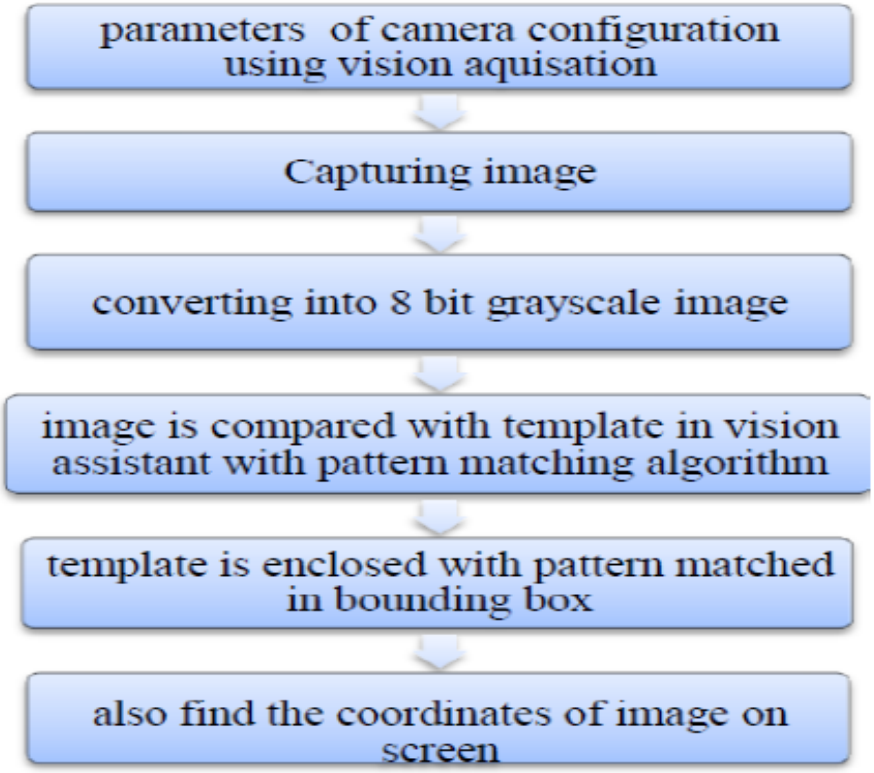

Figure 2: Block Diagram to present Methodology for implementation of pattern matching in LabVIEW

The analysis of image will be done to process for mathematical formation of image to morphological amenities. The image has been preprocessed to make pattern matching application. The image is first converted to gray scale (8-bit) from color image. The matrix and related calculations are getting easier than a colored image. The masking will be done to remove the plaque and noise from the image. The masking will sharpen the boundaries in the image to good extent. The masking processes are shown in Figure 3.

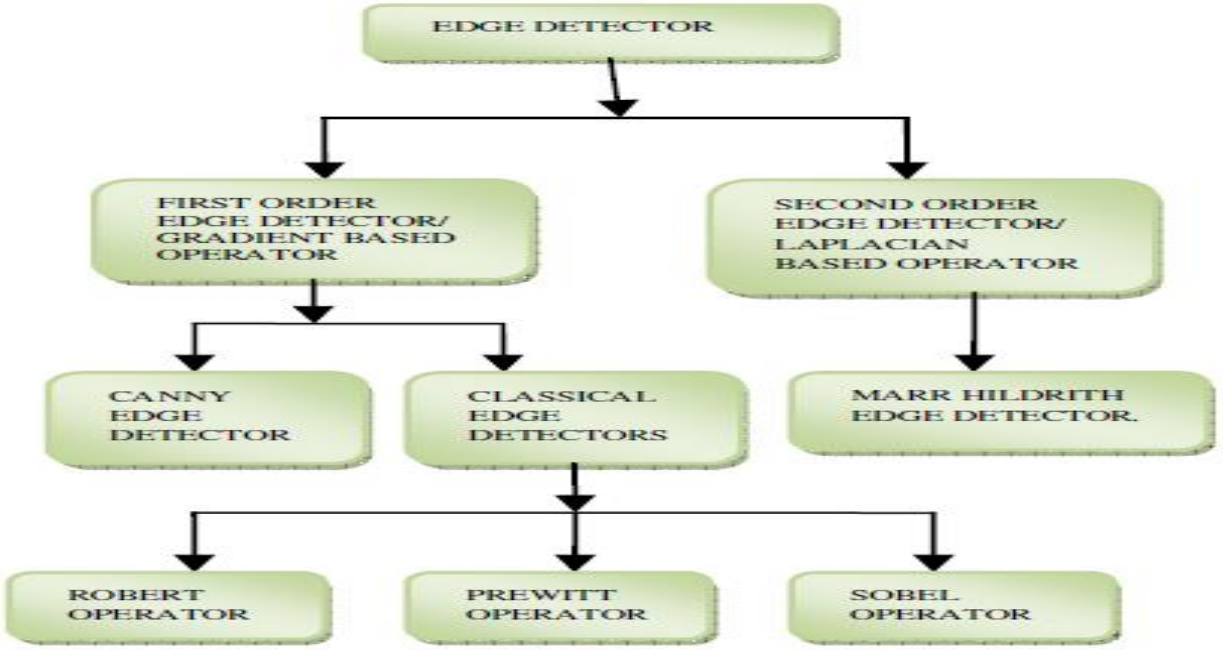

Figure 3: Masking methods for image analysis and improvement

3. Results and Discussion

RGB to Gray Scale Extraction: Very first, the image has been prepared to be captured to extract the image from associated camera. Figure 4 shows the image acquisition module.

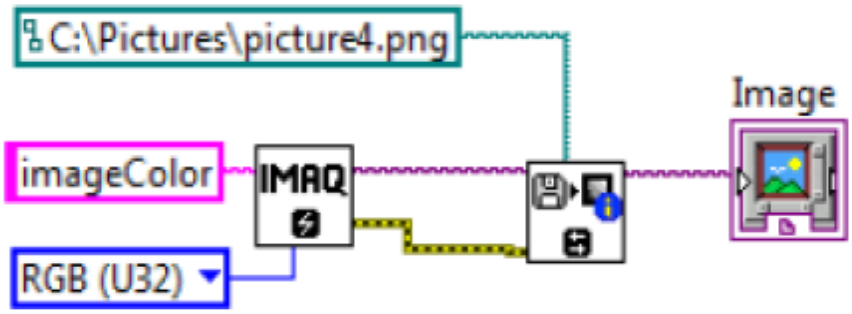

Figure 4: Image Acquisition module in LabVIEW

The IMAQ and IMAQ create pallets are used to install this image in to machine vision system.After image capturing method, the image is converted to gray scale for masking process. The masking is one of the mail tools to sort out the task. As pattern matching process is totally dependent on masking process. The respective tools are used. All the programming algorithms are formulated in While loop. The while loop is used to prevent infinite condition [13,14,15]. The While loop is also used to synchronization external devices with main processor to formulated the main communication protocol. Figure 5 shown the pattern matching logic for pattern matching application [16,17,18,19].

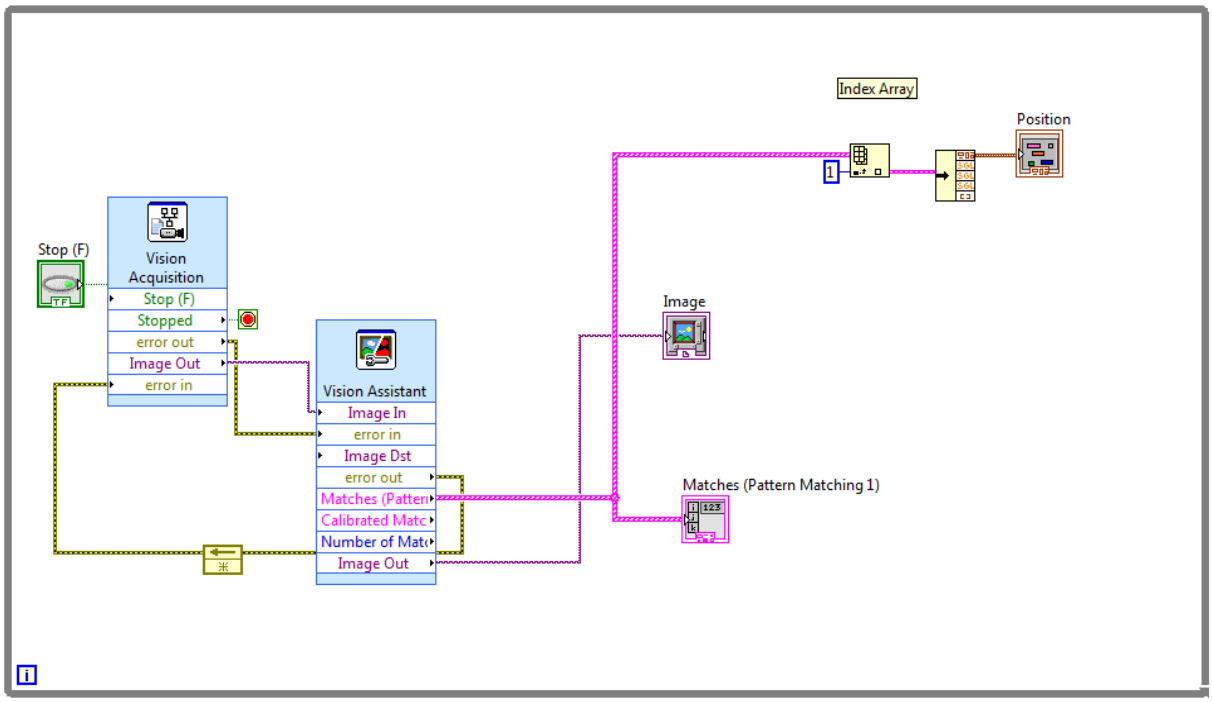

Figure 5: Pattern matching design in LabVIEW 2015

4. Conclusions

The paper is presenting the method to employ the use of machine vision to make pattern matching application. Testing and algorithm work with good selection ratio. Now various new features can be detected and new era of research has been established.

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