SMART MATERIAL HANDLING TROLLEY FOR INDUSTRIAL USE

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Abstract

Object sorting is an important aspect in almost all the industries. Production industries like food, chemical, petroleum and textile industries have to sort objects on numerous parameters. Various automated object sorting systems are required to avoid human flaws, with increase in productivity and reduce the overall time. Objective of the present work is to develop a part identification system using machine vision. Due to the advantage of LabVIEW in controlling hardware effectively it is employed in the present work. The Vision camera once identifies an object based on its attributes like color shape and size, immediately a signal should be communicated with the controller for separating that object. In this work the signal is shown as a glowing LED. Also the number of objects of particular category passing on the conveyor is counted and displayed to illustrate moving objects identification. A low speed conveyor belt is fabricated with different test objects passing over it. For identifying colors, wavelength data is used, for identifying the shape geometric pattern matching is used and for identifying the size edge detection is applied. The developed G-programming environment generates a graphic user interface in front panel. Ability to count the objects of specific attribute is tested for different trail runs. Thesis is organized as follows: Chapter 1 contains introduction to machine vision system, its components, the objectives of present study and literature review of similar works. Chapter 2 deals with various methods used in vision and their implementation in LabVIEW as done in this work was presented in chapter 3. Chapter 4 gives brief conclusions and future scope of present work

I n t r o d u c t i o n :

Humans are anxiously working on finding new ways of interacting with machines. However, a major breakthrough was observed when gestures were used for this interaction. A gesture is a form of non-verbal communication in which visible bodily actions communicate particular messages. It comprises of sound, light variation or any type of body movement. Based upon the type of gestures, they have been captured via Tactile (touch), Bionic and Motion Technologies through still camera, data glove, infrared

beams etc. Motion Technology has succeeded in drawing the attention of researchers from different parts of the world. Microcontroller is a small yet powerful device is rapidly changing the traditional ways of human-machine interaction.

The accelerometer can be freely rotated in space, temporarily varying 2-dimensional signal data is obtained from the phone's 3-axis acceleration sensor. This data is transmitted to a robot via Motor driver module of a robot. Further, it is processed by a microcontroller embedded on the robot for its desirable motions. In this context, a robot is an analogy for any machine that is controlled by man varying from a simple toy to heavy machinery. Robots have even replaced humans in performing various tasks that they are unable to perform due to physical disability, size limitation or extreme environments.

Fig.1 Transformer

Transformer is the electrical device that converts one voltage to another with little loss of power. Transformers work only with AC. There are two types of transformers as Step-up and Step-down transformer. Step-up transformers increase voltage, step-down transformers reduce voltage. Most power supplies use a step-down transformer to reduce the dangerously high mains voltage to a safer low voltage.
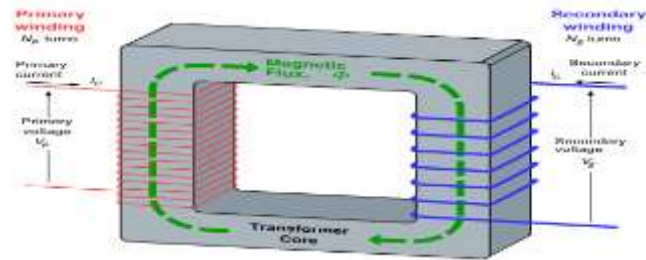
Fig.2:Working Model

NPN TRANSISTOR OPERATION:

Just as in the case of the PN junction diode, the N material comprising the two end sections of the NPN transistor contains a number of free electrons, while the center P section contains an excess number of holes. The action at each junction between these sections is the same as that previously described for the diode; that is, depletion regions develop and the junction barrier appears. To use the transistor as an amplifier, each of these junctions must be modified by some external bias voltage. For the transistor to function in this capacity, the first PN junction (emitter-base junction) is biased in the forward, or low-resistance, direction. At the same time the second PN junction (base-collector junction) is biased in the reverse, or high-resistance, direction. A simple way to remember how to properly bias a transistor is to observe the NPN or PNP elements that make up the transistor.
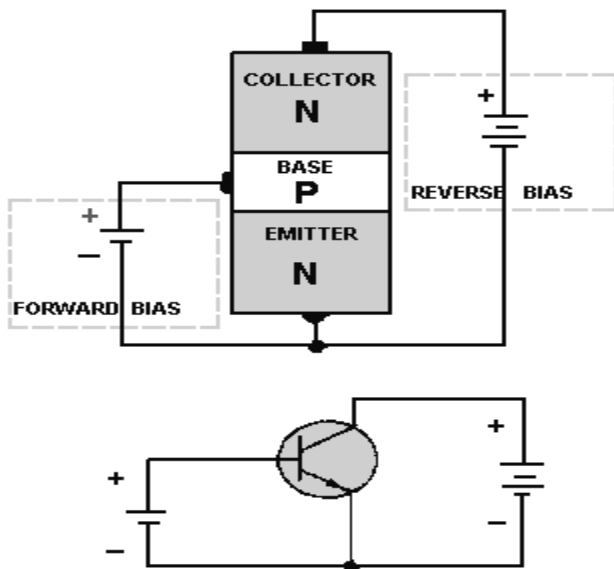
The PNP transistor works essentially the same as the NPN transistor. However, since the emitter, base, and collector in the PNP transistor are made of materials that are different from those used in the NPN transistor, different current carriers flow in the PNP unit. The majority current carriers in the PNP transistor are holes. This is in contrast to the NPN transistor where the majority current carriers are electrons. To support this different type of current (hole flow), the bias batteries are reversed for the PNP transistor. A typical bias setup for the PNP transistor is shown in figure 2-8. Notice that the procedure used earlier to properly bias the NPN transistor also applies here to the PNP transistor. The first letter (P) in the PNP sequence indicates the polarity of the voltage required for the emitter (positive), and the second letter (N) indicates the polarity of the base voltage (negative). Since the base-collector junction is always reverse biased, then the opposite polarity voltage (negative) must be used for the collector. Thus, the base of the PNP transistor must be negative with respect to the emitter, and the collector must be more negative than the base.
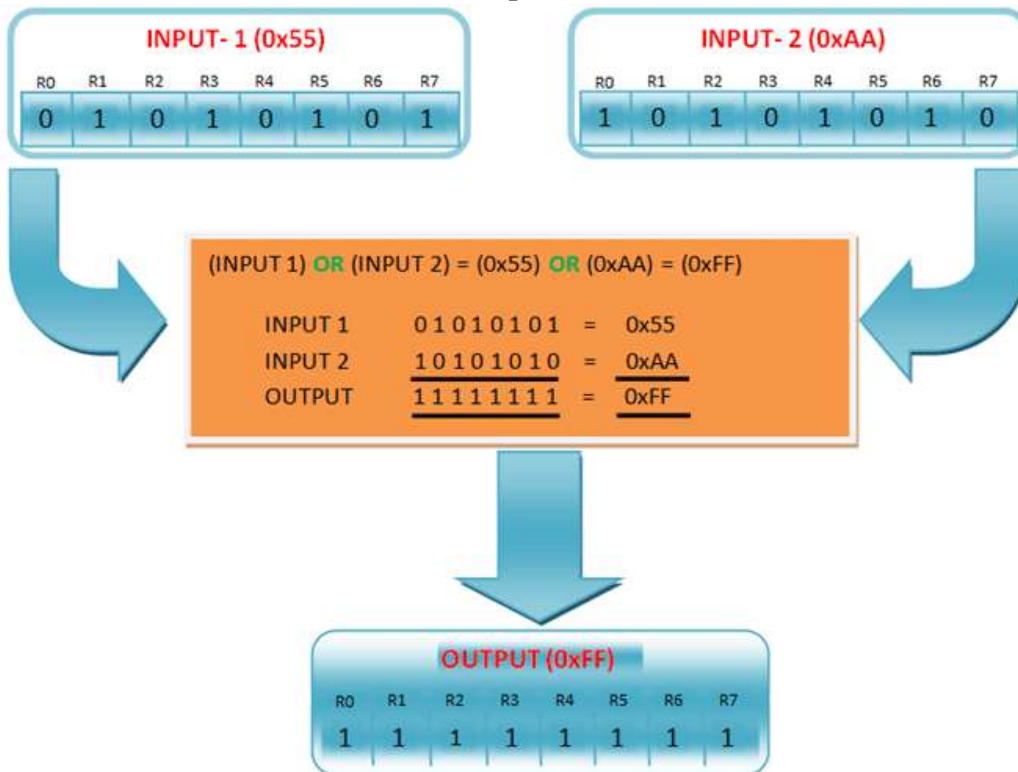
The CPU takes values from two input registers INPUT-1 and INPUT-2, performs the logical operation and stores the value into the OUTPUT register. All this happens in 1 execution cycle.

The ADXL335 is a complete 3-axis acceleration measurement system. The ADXL335 has a measurement range of ±3 g mini-mum. It contains a poly silicon surface-micro machined sensor and signal conditioning circuitry to implement open-loop acceleration measurement architecture. The output signals are analog voltages that are proportional to acceleration. The accelerometer can measure the static acceleration of gravity in tilt-sensing applications as well as dynamic acceleration resulting from motion, shock, or vibration.

The sensor is a poly silicon surface-micro machined structure built on top of a silicon wafer. Poly silicon springs suspend the structure over the surface of the wafer and provide a resistance against acceleration forces. Deflection of the structure is measured using a differential capacitor that consists of independent fixed plates and plates attached to the moving mass. The fixed plates are driven by 180° out-of-phase square waves. Acceleration deflects the moving mass and unbalances the differential capacitor

resulting in a sensor output whose amplitude is proportional to acceleration. Phase-sensitive demodulation techniques are then used to determine the magnitude and direction of the acceleration.
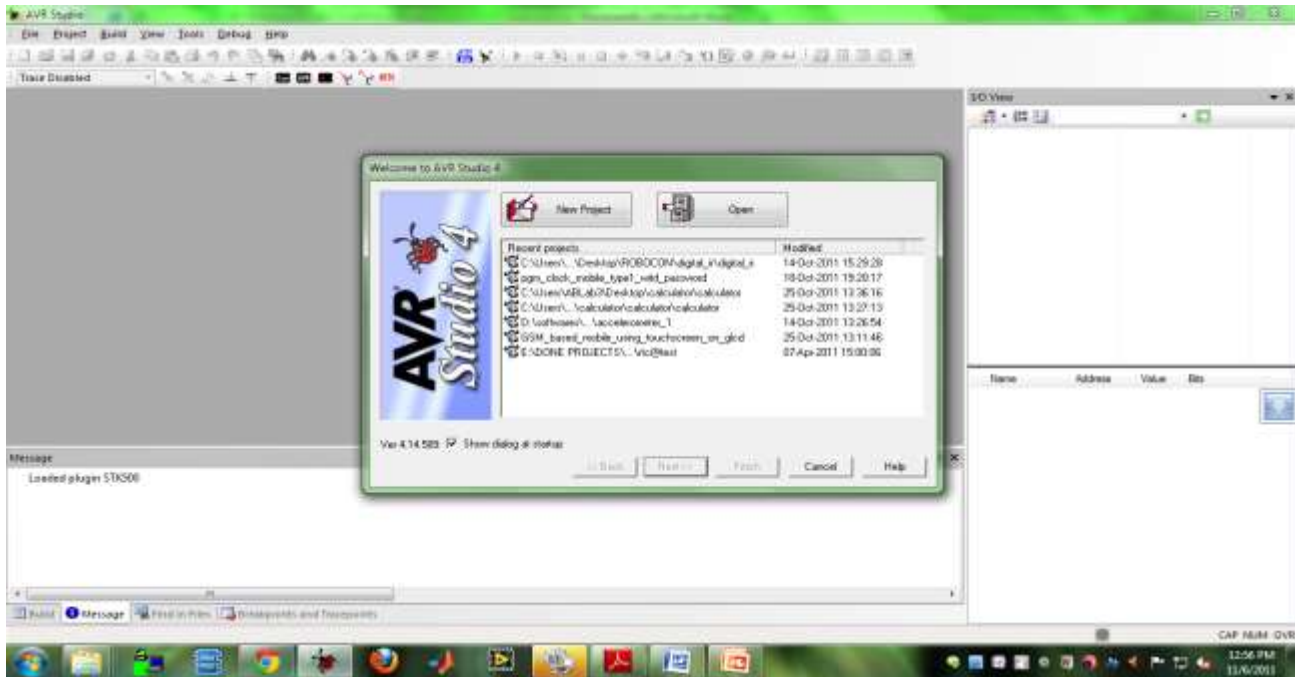
CONCLUSION

Embedded system is a latest technology in now days which we used in our project for controlling our system with body gesture.MEMS is an efficient technology which is working very efficiently in our system to control all the components of the circuit. So no doubt that, in future this project will help in many functions of leading organisation such as hospital, domestic uses etc.By doing this project we have been acquainted with the controller working and their programming to make the system working.

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