Preliminary Information

CogniSight Miniature Trainable Vision Sensor

Features

- **Image capture and recognition at 60 image per second on a single board smaller than of a matchbox**
- **Can learn and recognize a region of interest in the field of view as small as 16x16 and up to the full frame**
- **Trained by example. The knowledge is automatically generated by the neural network embedded in the CogniSight recognition engine**
- **Can classify the region of interest into up to 256 categories**
- **Output results on 16-bit data bus**
- **Output video on LVDS bus (Low Voltage Differential Signaling) @ 60 fps.**
- **I/O control through I2C master bus**
- **Autonomous operation under very low power consumption (12 mA). Can be battery operated (accept voltage from 4 to 30 volts).**
- **Setup and Training is made through a very simple PC-based control panel is delivered with the board.**
- **The knowledge of the CogniSight engine can be saved to and loaded from disk file.**

Applications

Image to Actuators
- industrial inspection

Image to Speech
- learning systems

Image to Motion
- micro-tracking, UAV

Image to Storage
- video surveillance

Description

CogniSight MTVS is the first miniature vision sensor with autonomous recognition capabilities, fully "hardwired" and sinking less than 15 milliamps...Recognition is performed without a single line of software at 60 frames per second. Although it is intended to recognize video images autonomously, a temporary connection to a host computer is needed to teach the recognition engine what to recognize or to load a pre-defined engine. For this purpose, the module is delivered with a USB adaptor board. Connection to a host can also be of interest to collect images and monitor the recognition.

The CogniSight MTVS module comes with a Control Panel software which lets you adjust the settings of the sensor such as its gain, shutter speed and more. You can select your region of inspection and teach the module to recognize up to 4 categories of regions. Also, you can decide to only view images in which the region of interest belongs to a specific category, with the option to save them to disk for selective recording. The knowledge stored in the neurons of the module can be exported to an Image Knowledge File (*.ikf). This IKF file can loaded on other CogniSight MTVS modules or platforms running a CogniSight engine.

So small…

The CogniSight MTVS module is composed of one CMOS sensor chip and one CogniSight recognition engine chip.

Video input
- Micron CMOS sensor MT9V022
- Monochrome, 752x480 pixel resolution
- Progressive scan, 30 or 60 fps
- Global shutter
- Miniature lens with 4.8 mm focal length
- 2 IR LEDs (880 nm)

Image recognition
- CogniSight image recognition engine, proprietary of General Vision and programmed on an Actel ProAsic3 FPGA.
- Fixed region of recognition (16x16 up to full video frame)
- Knowledge base of up to 18 models (expandable)

So simple…

The connectivity of CogniSight MTVS is made with one 8-wire connector for high-speed communication and one 16-bit I/O connector.

Main connector
- LVDS for video transmission (2 wires)
- I2C port for control commands (2 wires)
- Vcc and Ground

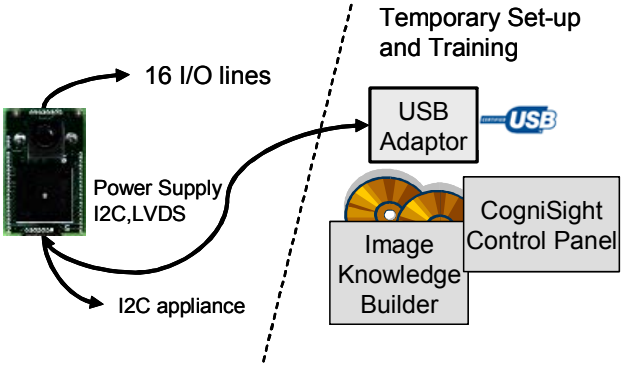
Output buses
16-bit I/O data bus
Optional neuron expansion bus

Electrical Specifications
- 4v to 30 v DC power supply
- Consumption <12 mA

Mechanical specifications
- 26 mm x 40 mm
- 1 ounce

Package contents

Our CogniSight MTVS Evaluation kit is intended to demonstrate to you that our 2-chip solution can do better than expensive conventional imaging systems. You will be able to evaluate the following items in no time:
- Sensor trainability and adaptive learning capabilities
- Sensor recognition speed
- Sensor compactness and low-power consumption
- Sensor image quality and collect images for training and testing
- How many neurons will you need for the final application (using IKB)



Package Contents

- CogniSight MTVS module
- USB adaptor board and cable
- CogniSight4MTVS control panel software
- Image Knowledge Builder (IKB*) software

*Image Knowledge Builder is an application intended to train and validate CogniSight recognition engines using large amounts of images and a very simple “show and tell” interface. IKB is not specifically designed for the CogniSight MTVS module, but for any application running a CogniSight engine. It generates image knowledge files which can be saved, distributed and even expanded with further teaching session.

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