A Software Demonstrator for Cognitive Image Processing Using the Associative Memory chip

ABSTRACT

- This presents the design of a software demostrator to be used in conjunction an embedded system for real-time pattern matching.
- The demonstrator was designed to verify the proper hardware operation and to calculate the various constants used, thus the operations on the underlying model are bit-accurate.
- The embedded hardware is based on systems that have been developed for use in the field of High Energy Physics(HEP) and, in particular, in the trigger system of the ATLAS Experiment.

CONTINUE

- The algorithm which is implemented is based on the learning process of the human vision and acts as an edge detector.
- The demonstrator is using the Qt application framework and the underlying model is written in C++
- The latter allows the fast and efficient use of the application for the parallel processing of multiple images, the generation of Pattern Banks and the calculation of the constants used in the hardware

EXISTING SYSTEM

- The improvement of detector technologies has led to an increase of image and video resolution neces-sitating the use of real-time image processing methods.
- The introduction of 3D imaging has also increased the amount of produced data as well as the processing complication. 3D im-age processing is especially useful in biomedical applications such as PET and MRI.
- Processing faster this type and size of data requires clever and efficient preprocessing steps executing data reduction techniques, such as filtering, while maintaining the information that is useful to the next processing

PROPOSED SYSTEM

- presents the design of a software demonstrator to be used in conjunction an embedded system for real-time pattern matching
- The embedded hardware is based on systems that have been developed for use in the field of High Energy Physics(HEP) and, in particular, in the trigger system of the ATLAS Experiment.

HARDWARE REQUIRMENT

- Processor - Intel
- Speed - 1.1 Ghz
- RAM - 256 MB(min)
- Hard Disk - 20 GB
- Monitor - SVGA

SOFTWARE REQUIRMENT

- Tool - MATLAB R2012
- Operating system - Windows Xp, 7

REFERENCES

- “The atlas experiment at the cern large hadron collider,” JINST, vol. 3,no. 08, p. S08003,2008.[Online].Availablehttp://stacks.iop.org/1748-0221/3/i=08/a=S08003
- M. M. D. Viva, G. Punzi, and D. Benedetti, “Information and perceptionof meaningful patterns,” in PloS one, 2013.
- M. Borda, Fundamentals in Information Theory and Coding. SpringerNature, 2011.
- International Telecommunication Union. (2011) Studio EncodingParameters of Digital Television for Standard 4:3 and Wide-Screen 16:9Aspect Ratios.