Vision Processors for Embedded Computer Vision
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Abstract

The trend of cameras becoming ubiquitous is continuing, and we can find cameras everywhere from security cameras in cities world-wide to onboard cameras in cars. In order to process visual information from such cameras in real-time, a practical approach is to design embedded systems using vision processors (LSIs for computer vision). We therefore need high-performance vision processors that can run sophisticated computer vision algorithms with low power consumption and with sufficient robustness for outdoor operation.

I will start with an overview of recent vision processors, many of which are designed for automotive safety systems. Such advanced driver assistance systems (ADAS) will soon find wide application for active safety and may eventually lead to automated driving. As an example I will introduce Toshiba's vision processor series, an efficient automotive LSI that runs vision algorithms such as obstacle detection, stereo depth estimation, and SfM.

Automated analysis of data from surveillance cameras is another area where vision processors will find wide application, effectively turning cameras into intelligent sensors for human activities. I will introduce such an intelligent sensor using Toshiba's vision processor and algorithms.