

A Mega-Pixel Resolution Digital Still Camera

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A novel high definition digital still camera (HD-DSC) was designed for high resolution image capturing. This HD-DSC can be used for computer input, high quality desktop publishing, professional photographics, etc. The system consists of optical lens; CCD sensor and its driving circuits; pre-processing for auto focus, auto exposure and their control, the digital signal processing, and computer interface.

An 1.5 mega-pixel CCD full frame array is employed for photo sensing. To make the system friendly, the following functions are included: auto focus, auto exposure, and auto white balance. These functions are implemented with the same CCD array as a sensor, without having additional viewfinder. Therefore the real time image capturing and continuous exposure are required. With a full frame transfer CCD array, a shutter wheel is needed in this design to serve this purpose. The auto exposure algorithm uses fuzzy logic decision and picture segments for the judgment of appropriate exposure.

The digital signal processing performs the following functions: defect compensation, interpolation, black level clamp, color matrix and conversion, white balance calculation, and R-G-B output for display. A JPEG standard compression is an option for storage. The system will interface with personal computer via SCSI.

The hardware architecture and system analysis will be presented. The experimental results of pre-processing algorithm and digital signal processing will also be discussed.

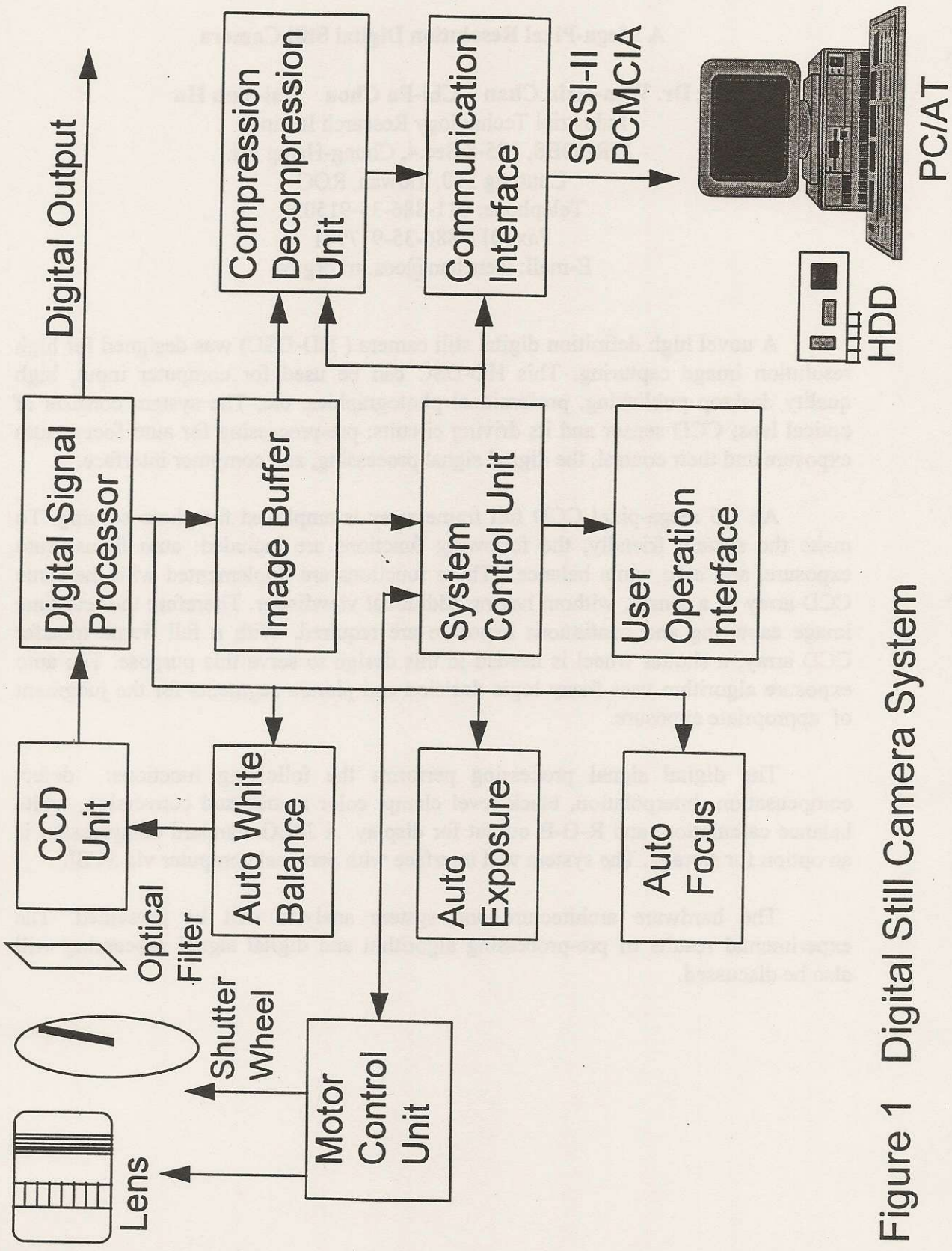


Figure 1 Digital Still Camera System

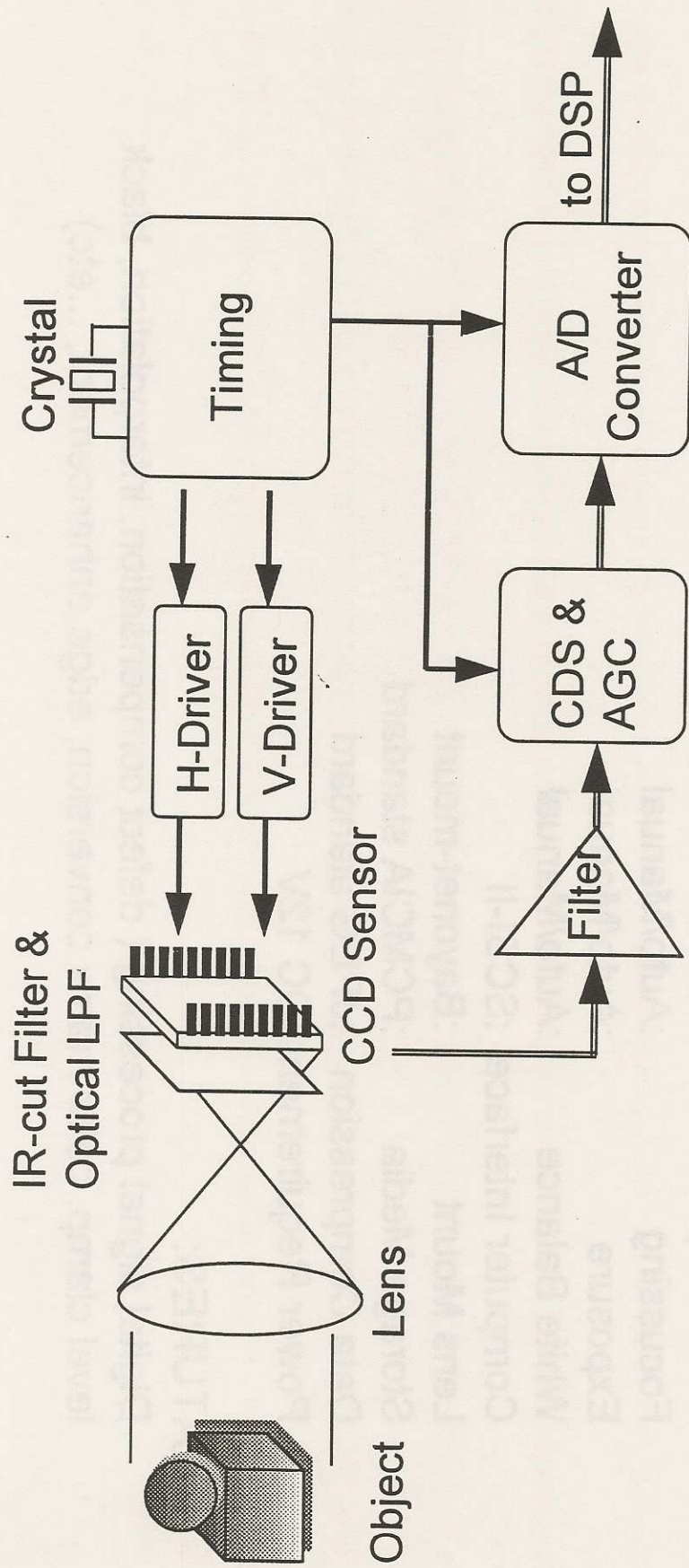


Figure 2 CCD Unit Block Diagram

SPECIFICATION:

Image Device	: Full frame transfer color CCD Imager 1526(H)x1024(V) pixels
Shutter Speed	: 1/2 sec - 1/500 sec
Focussing	: Auto/Manual
Exposure	: Auto/Manual
White Balance	: Auto/Manual
Computer Interface	: SCSI-II
Lens Mount	: Bayonet-mount
Storage Media	: PCMCIA standard
Data Compression	: JPEG standard
Power Requirement	: DC 12V

FEATURES:

Digital signal processing (defect compensation, interpolation, black level clamp, color matrix conversion, edge enhancement, ...etc)

Table 1