Design of Heterogeneous Environment

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Graduate Research Paper

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3.1 Hardware

The hardware platform used is the Xilinx ZC702 Evaluation Board, featuring a Zynq® XC7Z020 System on a Chip (SoC).

3.2 Operating System

The operating system choosen to run on the Zynq ZC702

3.3 Bilinear Interpolation

4. Design

4.1 Common Design Components

4.1.1 Tagged Image File Format

All images used throughout this research are Tagged Image File Format (TIFF) images. TIFF images consist of an image header that describes the byte order, TIFF version number, and offset to the image file directory[2]. The image file directory stores the offsets to the directory entries and varies in size based on the number of images contained within the TIFF image. The directory entry is then broken down into several sections including a Tag section which consists of a number of tags which give information about the image including the bits per pixel, compression scheme, image length and height, and many more. The directory entry is lastly completed with the offset to the image data. Figure 4.1 shows a more indepth representation of the TIFF structure for multiple image TIFFs.

For the purposes of this research, only uncompressed TIFF images are used in order to eliminate the need for resource intensive decompression and compression of input and output images. To support the reading and writing

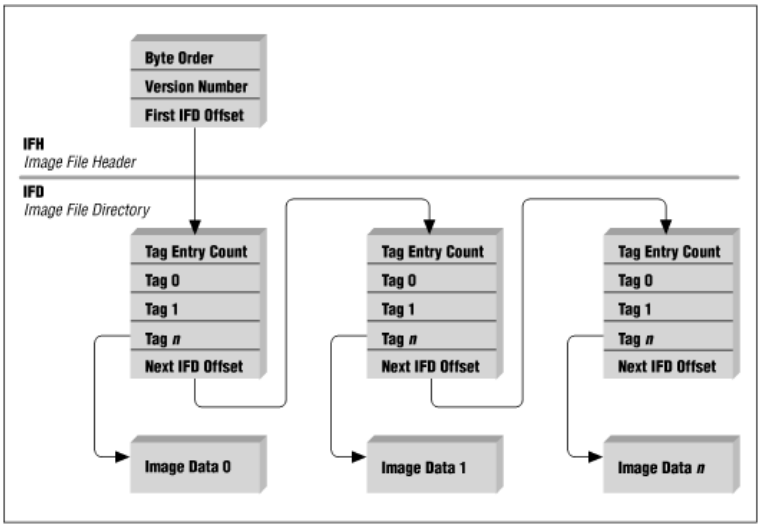

Figure 4.1: TIFF File Structure[1]

of these image files, the LibTiff libary is cross-compiled for use on the ZC702's PetaLinux OS.

5. Results

6. Conclusion

Bibliography

[1] James D. Murray and William Van Ryper. *Encyclopedia of Graphics File Formats, 2nd Edition.* O'Reilly Media, 1996.

[2] Richard H. Wiggins, H. Christian Davidson, H. Ric Harnsberger, Jason R Lauman, and Patricia A. Goede. Image file formats: Past, present, and future. *RadioGraphics*, 21:789–798, 2000.