Simulation Instructions - Image Edge Detection

The following instructions provide details on how to run the simulation project code in Vivado to produce an edge-detected output image from an input image. The code is currently configured to process only 768x512 sized 24-bit-per-pixel images.

1. Generate a newline-delimited hex file from an input image. The MatLab script *Create\_Hex\_File.m* creates the hex file “Cathedral\_Input.hex” from the input image “Cathedral\_Input.bmp”.

2. Configure the simulation runtime in Vivado to be 20ms. This time is required so all data elements of the image can be processed.

3. Run the simulation until 20ms has been reached. The code is already configured to read in the input hex file “Cathedral\_Input.hex” from the same directory in which the top level source file resides.

4. Once the simulation has concluded, the output file “Cathedral\_Output\_Edge\_Detected.hex” will be written to the location …\Simulation\_Edge\_Detection.sim\sim\_1\behav\xsim.

5. To post-process the output hex file to produce a viewable image, run the Image Post Processing application. Specify the input hex file name and location (i.e. “C:\Users\Desktop\Cathedral\_Output\_Edge\_Detected.hex”), the image width to be 768, the height to be 512, and the output jpeg file name and location (i.e. “C:\Users\Desktop\Cathedral\_Output\_Edge\_Detected.jpeg”).

6. The edge-detected image will be created and saved to the specified location.

**Note:** if the simulation is re-run, the output hex file in the \xsim folder must be deleted because the write functionality is set to append mode in the source code.