GH09.B.6.2dconv – 2 Dimensional Convolution

This specifies details about the workloads associated with the GH09.B.6 design.

Note that the workloads and the golden functional model for this design used fixed point, but do not worry about the floating point overflow. We simply just do all the operations in the convolution and mask with 65535 to get the lower 16 bits out.

Input Workloads

The workloads for this benchmark that when combined with this design specification, form a benchmark. The workloads for this design are defined by the following events. Please see the groundhog_09_meta_document.pdf for a description of workloads.

For this design the key input events are:

- reset – the reset signal [signal event]

    o <value0> tag is the associated Boolean value of the signal. Note that the value can be flipped if the designers wish, and the goal is to indicate the initialization of the system.

- input_block – this is a block of data that will be passed to the convolution matrix. This block should be a string of data that is X*4 hex long where X is currently defined as 25+400*400 for the convolution matrix and the input matrix. This block will be read into the device for X input_data_valid signals. The input_block format is a way of specifying a buffer of data in the external environment that will be streamed into the SUT. [macro event]

    o <value0> is the hex string that is X*4 characters long.

- input_data_valid – this is the signal that indicates the data on the input pins is ready. In the case when this resource is associated with an input resource then it is a simple read. If associated with an input_block resource it means to read the next 32bytes of the input_block's string. [signal event]

    o <value0> is the Boolean signal being sent. The default signal will be 1, but note that within the workload there is no associated 0 signal to state that the signal is off.

Outputs from the golden functional model tool

The associated output resources that will be generated by the golden functional model are:

- output – this is the 12bit output hexadecimal string that represents the output matrix value that would be sent out on the parallel bus [macro event]

    - <value0> is the 4 character hex string

Note, neither the output_data_valid or input_data_accept signals are included in the output workload. These signals are part of the handshaking protocol and have been left out for simplicity. These signals, if used, should be verified by the designer.