Dataflow Supercomputing

Mean Filter & Matrix Multiplication

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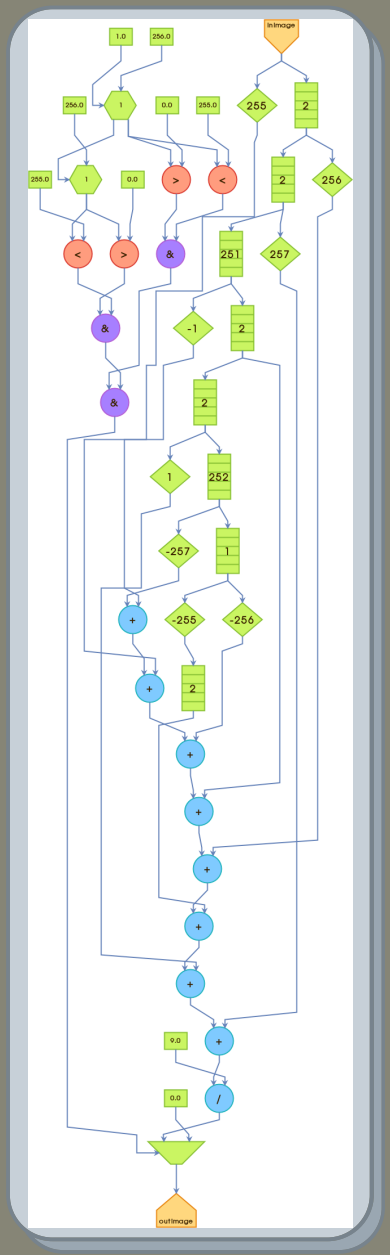
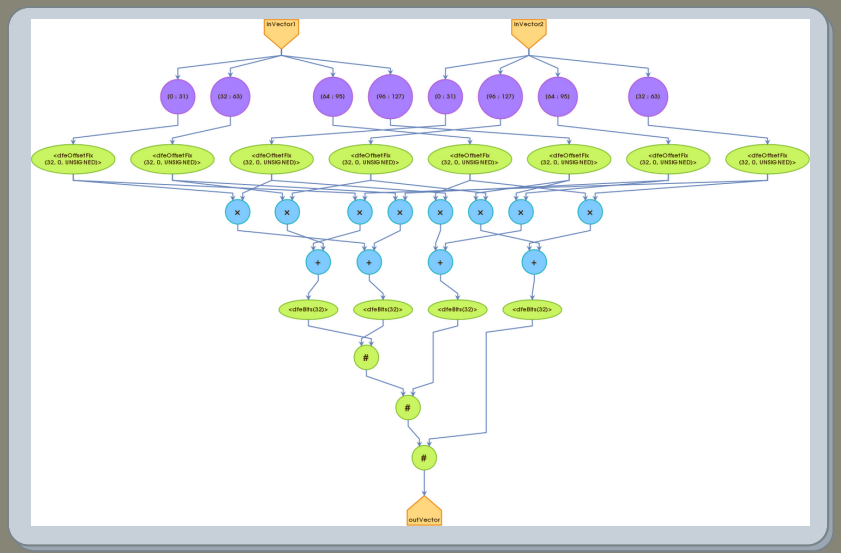
Figure 1. Image Processing - Mean Filter



Two programs where implemented using the programming environment Maxeler WebIDE, which is a simulation. Both of these examples demonstrate that simple control flow solutions can be implemented using the Dataflow paradigm. This novel paradigm introduces computing in space. Computations are place dimensionally on a chip and therefore Dataflow has an advantage in speed, power, and size. Because of this, it is common to see the Dataflow approach as the most effective way to achieve the speeds for big data applications despite a minute difference in performance for small data sets. These programs successfully accelerated matrix multiplication and an image processing 2D smoothing convolution with a mean filter using the Maxeler Dataflow approach. The Maxeler compiler generates a execution graph that corresponds to code from any given programming example. In this case, Figure 1 for image processing with a mean filter and Figure 2 for matrix multiplication.

Figure 2. Math - Matrix Multiplication



References:

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