
EXHIBIT I

Claim 1

A (P) method for data processing in a reconfigurable (A) computing system, the reconfigurable computing system comprising at least one (G) reconfigurable processor, the reconfigurable processor comprising a plurality of functional units, said method comprising:

ZEBRA – FASTER NEURAL NETWORK INFERENCE FOR AWS F1



(G)

Mipsology offers FPGA-based class-leading acceleration for Deep Learning, with no FPGA knowledge required. We leverage more than 20 years designing high-performance FPGA-based systems to offer our users the best solutions for Deep Learning.

Mipsology's first product, Zebra, offers users FPGA-based class leading acceleration for Neural network inference. There is zero FPGA knowledge required nor a single line of code to write to use Zebra.

runs user defined neural network just as it would on GPU or CPU, switching takes minutes.

(P)

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A (P) method for data processing in a reconfigurable (A) computing system, the reconfigurable computing system comprising at least one (G) reconfigurable processor, the reconfigurable processor comprising a plurality of functional units, said method comprising:

Mipsology

Zebra Deep-Learning engine for Caffe (1 FPGA)

Sold by: Mipsology SAS

30 Day Free Trial Available - Zebra accelerates neural network inference using FPGA. User-defined neural networks can be run on Zebra just as they would be by a GPU or a CPU. Zebra is fully integrated with the traditional Deep Learning frameworks like Caffe, MXNet or TensorFlow. There is zero FPGA knowledge required nor a single line of code to write to use Zebra. You just use the Zebra library to switch from CPU or GPU to FPGA in minutes. Zebra includes the FPGA image and the software needed to run on no FPGA compilation or FPGA tools to use. This AMI contains the following components: o Includes Zebra FPGA accelerator for Caffe. o This AMI supports your own CNN, similar to AlexNet and GoogleNet neural networks. o Supports 1 FP (with f1.2xlarge). o Pre-installed Caffe. o Includes pre-trained models like AlexNet, VGG-16, VGG-19, etc. <http://www.mipsology.com>



F1 FPGA Instance Types on AWS

- Up to 8 Xilinx UltraScale+ 16nm VU9P FPGA devices in a single instance
- The **f1.16xlarge** size provides:
 - 8 FPGAs, each with over 2 million customer-accessible FPGA programmable logic cells and over 5000 programmable DSP blocks
 - Each of the 8 FPGAs has 4 DDR-4 interfaces, with each interface accessing a 16GiB, 72-bit wide, ECC-protected memory



Instance Size	FPGAs	DDR-4 (GiB)	FPGA Link	FPGA Direct	vCPUs	Instance Memory (GiB)	NVMe In Storage
f1.2xlarge	1	4 x 16	-	-	8	122	1 x
f1.16xlarge	8	32 x 16	Y	Y	64	976	4 x

Source: <https://aws.amazon.com/marketplace/pp/B073SHB43M>

Claim 1

A method for data processing in a (A) **reconfigurable computing system**, the reconfigurable computing system comprising one (G) **reconfigurable processor**, the reconfigurable processor comprising a plurality of (FU) **functional units**, said method comprising:

(A)
↙ ↘

F1 FPGA Instance Types on AWS

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Instance Size	FPGAs	DDR-4 (GiB)	FPGA Link	FPGA Direct	vCPUs	Instance Memory (GiB)	NVMe Instance Storage (GB)
f1.2xlarge	1	4 x 16	-	-	8	122	1 x 470
f1.16xlarge	8	32 x 16	Y	Y	64	976	4 x 940

(G) → **FPGA** Intel Stratix-10 GX2800 **Xilinx VU9P** Xilinx VU13P

(FU) → **DSP** 5,760 (11,520 mult) **6,840** 12,288

Boolean Logic 2,753k LE 2,586k LC 3,780k LC

Flip-Flops 3,732k 2,592k 3,456k

Table 1 : Logic available in newest FPGA

Source: <https://www.slideshare.net/AmazonWebServices/deep-dive-on-amazon-ec2-f1-instance-may-2017-aws-online-tech-talks>;

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A (P) method for data processing in a reconfigurable (A) computing system, the reconfigurable computing system comprising at least one (G) reconfigurable processor, the reconfigurable processor comprising a (FU) plurality of functional units, comprising:

(P)

In January 2017, our team demonstrated Zebra executed on a KU115 – showcasing the fastest 100 percent FPGA-based solution computing any neural network inference (as far as we've been able to determine).

(A)

We ported Zebra to AWS in just two months, and will soon offer access to our Zebra f1 implementation on AWS Marketplace. In Q2, we will support all convolutional neural networks (CNN) similar to AlexNet and GoogLeNet, delivering inference performance reaching 4000 images per second and more than 100 images per second per watt. We will also add support for Caffe and MXNET infrastructures, so our users will never have to worry about their FPGAs running "undercover."

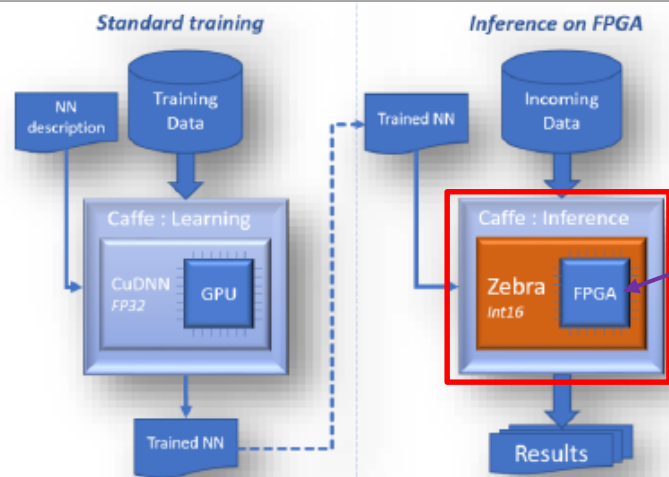


Figure 1: Mipsology Zebra general flow. The GPU is replaced by an FPGA when performing inference in the same infrastructure.

(G)

(FU)

FPGA	Intel Stratix-10 GX2800	Xilinx VU9P	Xilinx VU13P
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