FPGAS ACCELERATING AI FOR FINANCIAL SERVICES

Intel[®] Network & Custom Logic Group (NCLG)

Intel® AI Hardware – Device, Edge, and Multi-Cloud

OPTIMIZED SOFTWARE STACK

CPU **FPGA** **GPU** **ACCELERATORS**

WORKLOAD BREADTH ——————————————————————→ **AI SPECIALIZATION**

| Multi-purpose foundation for artificial intelligence (AI) | Real-time deep learning inference and more | Highly-parallel media, graphics and compute | Multi-modal deep learning inference | Edge media and vision inference | Deep learning training |

All products, computer systems, dates, and figures are preliminary based on current expectations, and are subject to change without notice.

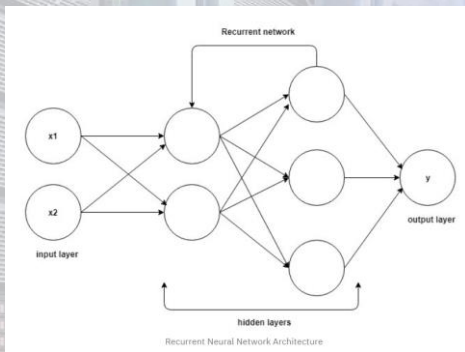[1]Unified software stack development in progress

www.intel.ai/technology

Scale Your Innovation

RNNs for Financial Applications

Recurrent neural networks (RNNs) are neural networks with memory

Recurrent Neural Network Architecture

Fraud detection

Anti-money laundering

Speech recognition

Requirements

- Low latency for real-time response

- High memory-to-compute ratio for increased performance

Intel® FPGAs Well Suited to Address RNN Workloads

Intel® FPGAs enabling technologies

- Pipelining

- Many large independent local memories

- Independent DSP

What this means for RNN applications:

Delivering batch 1 performance	**54 TOPs at 60 W**
High memory bandwidth	**Up to 58TB/s**
Delivering unstructured sparsity	**96% sparsity**

If you would like to hear more, stop by our stand today

Not STAC Benchmarks

RNN Demo at Booth

	Myrtle results
Platform	Intel® FPGA PAC D5005 [1]
Sparsity (%)	96
Batch Size	1
Effective Throughput (TOPS)	54.0
Power (W)	60
Performance per Watt (Effective GOPS/W)	1547
Latency per 1s input audio (mS)	**0.343**

myrtle.ai (intel)

Speech Transcription

This demo showcases Speech to Text conversion using Myrtle's Recurrent Neural Network accelerator running on an Intel® Stratix® 10 FPGA. Details

51.49 TOPS	3968.5X	60 W	3.94% WER

in this incident contrasting the creative and the destructive spirit of the factions the emigrant aid society of massachusetts finds its most honorable and triumphant vindication
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the wizard of oz who used to be a humbug and knew no magic at all has been taking lessons of glinda and i'm told he is getting to be a pretty good wizard but he is merely the assistant of the great sorceress
the wise of ye who used to be a humbug a new nomadic at all has been taking lessons of glinda and am told he is getting to be a pretty good wizard but he is merely the assistant of the great sorceress

from these again sprang barricaded and fortified dwellings camps and scouting parties finally culminating in roving guerrilla bands half partisan half predatory
from these again sprang barricaded and fortified dwellings camps and scout parties finally culminating in roving gorilla bands half partisan half predatory

olive has another lovely gift for the yellow house said mother carey rising and to carry out the next part of the programme we shall have to go in procession upstairs to my bedroom
olive has another lovely gift for the yellow house said mother carey rising and to carry out the next part of the programme we shall have to go in procession upstairs to my bedroom

Not STAC Benchmarks

1. Intel® Programmable Acceleration Card (Intel PAC) measurements taken in conjunction with Intel i7-7700K at 4.20 GHz, RAM 4 * 16 GB at 2,800 MHz, 1 TB M.2 PCIe* SSD, PRIME Z270-P motherboard, 650 W PSU, Ubuntu
2. Peak throughput of 53.37 TOPS measured over shorter input duration of 200 ms, When measuring latency over a 1s input period, peak throughput drops to 23 TOPS

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