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Running PyTorch codes with multi-GPU/nodes on national systems

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Outline

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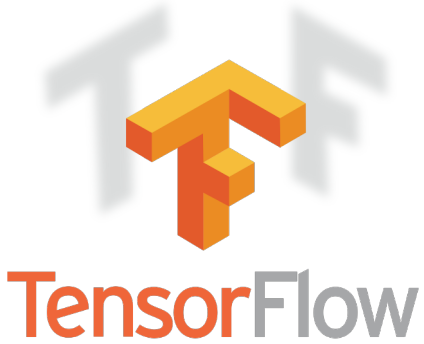
TensorFlow

- The most widely used framework open-sourced by Google
- Replaced Google's DistBelief framework
- Runs on almost all architectures (CPU/GPU/TPU/etc)
- Define-and-Run type for neural networks
- Version 2.0+ has Define-by-Run component(Eager execution)
- https://github.com/tensorflow/tensorflow



PyTorch

- Rapidly growing in research community for deep learning framework developed by Facebook
- A Python adaptation of Torch
- Caffe2 has been merged to PyTorch
- Define-by-Run type for neural networks
- Ease of expression and use
- https://github.com/pytorch/pytorch

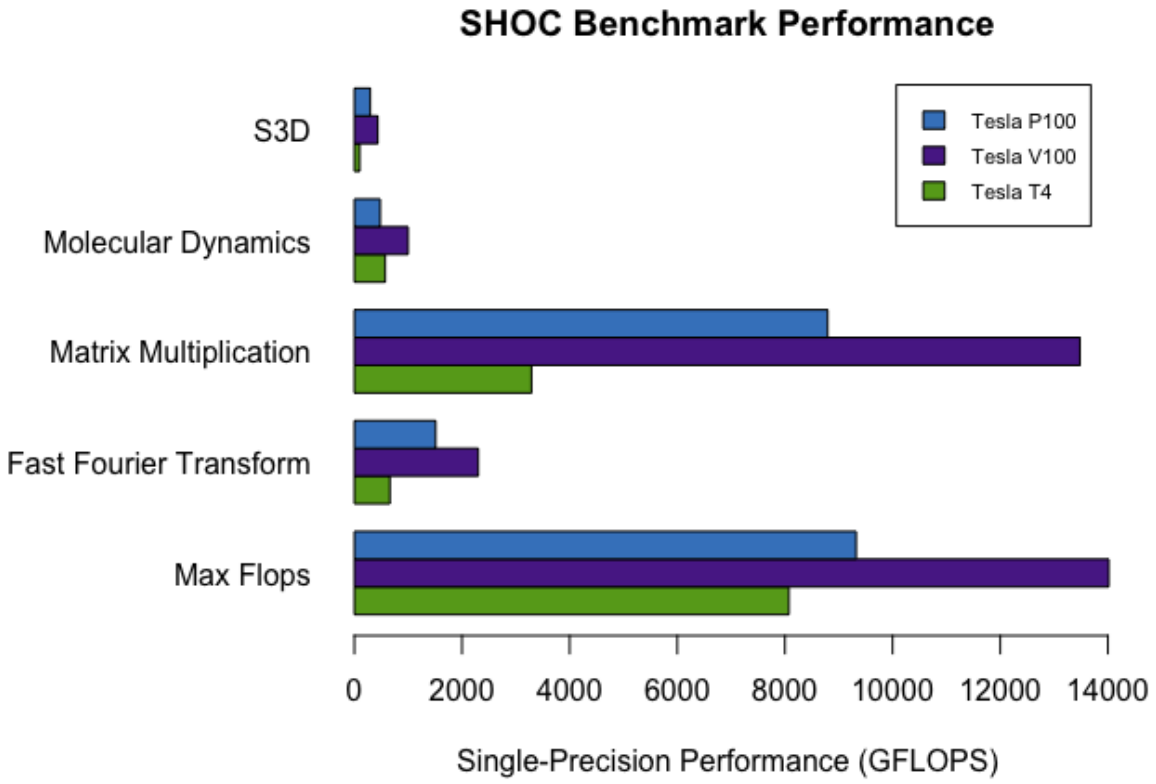
GPU resources in Compute Canada

	# of nodes	GPU type
Graham	160	P100 Pascal
	7	V100 Volta
	36	T4 Turing (for DL)
Cedar	146	P100 Pascal
	192	V00 Volta
Beluga	172	V100 Volta
Narval	159	A100 (40GB)

Which GPUs?

Available GPUs in Graham

	P100	V100	T4
Availability	Best	Good	Better
Double Pre.	5.3 TF	7.8 TF	N/A
Single Pre.	10.6 TF	15.7 TF	8.1 TF
Tensor core	N/A	620	320



https://www.microway.com/hpc-tech-tips/nvidia-turing-tesla-t4-hpc-performance-benchmarks/tesla_comparison_t4-p100-v100/

Demo: Virtual enviornment

Allows users to create virtual environments
so that one can install Python modules easily
many versions of same module are possible

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Demo: Running a code on Single node

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Demo: Running a code on Multiple nodes

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Demo: PyTorch + Tensorboard

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Thanks!