Data Parallelism: How to Train Deep Learning Models on Multiple GPUs

Report of Contributions

Contribution ID: **1** Type: **not specified**

Welcome and Introduction

Monday, November 6, 2023 9:00 AM (15 minutes)

- Meet the instructor.
- Create an account at courses.nvidia.com/join

Contribution ID: **2** Type: **not specified**

Stochastic Gradient Descent and the Effects of Batch Size

Monday, November 6, 2023 9:15 AM (2 hours)

Learn the significance of stochastic gradient descent when training on multiple GPUs

- Understand the issues with sequential single-thread data processing and the theory behind speeding up applications with parallel processing.
- Understand loss function, gradient descent, and stochastic gradient descent (SGD).
- Understand the effect of batch size on accuracy and training time with an eye towards its use on multi-GPU systems.

Contribution ID: **3** Type: **not specified**

Training on Multiple GPUs with PyTorch Distributed Data Parallel (DDP)

Monday, November 6, 2023 12:15 PM (2 hours)

Learn to convert single GPU training to multiple GPUs using PyTorch Distributed Data Parallel

- Understand how DDP coordinates training among multiple GPUs.
- Refactor single-GPU training programs to run on multiple GPUs with DDP.

Contribution ID: **4** Type: **not specified**

Maintaining Model Accuracy when Scaling to Multiple GPUs

Monday, November 6, 2023 2:30 PM (1h 30m)

Understand and apply key algorithmic considerations to retain accuracy when training on multiple GPUs

- Understand what might cause accuracy to decrease when parallelizing training on multiple GPUs.
- Learn and understand techniques for maintaining accuracy when scaling training to multiple GPUs.

Contribution ID: **5** Type: **not specified**

Workshop Assessment

Monday, November 6, 2023 4:00 PM (30 minutes)

Use what you have learned during the workshop: complete the workshop assessment to earn a certificate of competency

Contribution ID: **6** Type: **not specified**

Final Review

Monday, November 6, 2023 4:30 PM (15 minutes)

- Review key learnings and wrap up questions.
- Take the workshop survey.