Fundamentals of Accelerated Computing with CUDA Python

Report of Contributions

https://indico.kit.edu/e/3686

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

Welcome and Introduction

Monday, July 24, 2023 9:00 AM (15 minutes)

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

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

Introduction to CUDA Python with Numba

Monday, July 24, 2023 9:15 AM (2 hours)

- Begin working with the Numba compiler and CUDA programming in Python.
- Use Numba decorators to GPU-accelerate numerical Python functions.
- Optimize host-to-device and device-to-host memory transfers.

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

Custom CUDA Kernels in Python with Numba

Monday, July 24, 2023 12:15 PM (2 hours)

- Learn CUDA's parallel thread hierarchy and how to extend parallel program possibilities.
- Launch massively parallel custom CUDA kernels on the GPU.
- Utilize CUDA atomic operations to avoid race conditions during parallel execution.

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

Multidimensional Grids, and Shared Memory for CUDA Python with Numba

Monday, July 24, 2023 2:30 PM (2 hours)

- Learn multidimensional grid creation and how to work in parallel on 2D matrices.
- Leverage on-device shared memory to promote memory coalescing while reshaping 2D matrices.

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

Final Review

Monday, July 24, 2023 4:30 PM (15 minutes)

- Review key learnings and wrap up questions.
- Complete the assessment to earn a certificate.
- Take the workshop survey.