Codee Training Series

April 26-27, 2022

NERSC

codee

Shift Left Performance

Automated Code inspection for Performance

First: Introduction to Codee - Shift Left Performance

#1 Introduction to Codee tools: Shift Left Performance

- Introduction to Codee and the **shift left** approach
- **Open catalog of coding rules for performance** optimization
- **Automated code inspection with Codee**: Discover and Adopt
- **Quick start to Codee**: Canny image processing
- Hands-on: **Optimizing PI** on Perlmutter

Format:

- Remote lectures (~30’), demos. and hands-on sessions

Second: Addressing GPU challenges with Codee

#2 Usage of Codee for GPU programming (1/2)

- The **GPU programming challenges**
- Memory usage, massive parallelism exploitation, and data transfers minimization
- **Codee's support** to **find opportunities for offloading** and **optimize memory layout for data transfers**
- Hands-on: Optimizing **MATMUL** on Perlmutter

Format:

- Remote lectures (~30'), demos, and hands-on sessions

Third: Addressing more GPU challenges with Codee

#3 Usage of Codee for GPU programming (2/2)

- The **GPU programming challenges**
- **Codee’s support to identify defects in data transfers**
- Hands-on: **Optimizing MATMUL** on Perlmutter

Format: sessions

- Remote lectures (~30’), demos, and hands-on exercises

Finally: A systematic, more predictable path !

#4 Putting it all together

- Hands-on: **Optimizing LULESHmk** on Perlmutter
- Hands-on: **Work on your own code**

Format:

- Remote demos and hands-on sessions

The journey towards GPU in this workshop

		Challenges of GPU acceleration addressed in introductory course			Other GPU programming challenges to be addressed in next advanced course			
		Find opportunities for offloading	Optimize memory layout for data transfers	Identify defects in data transfers	Exploit massive parallelism through loop nest collapsing	Minimize data transfers across consecutive loop nests	Minimize data transfers through convergence loops	Identify auxiliary functions to be offloaded
Example codes used in this introductory course	**PI**	x	-	-	-	-	-	-
	MATMUL	x	x	x	x	x	-	-
	LULESHmk	x	x	x	x	x	x	x
	HEAT	x	-	-	-	x	x	-
	Your code!	Probably all of these challenges apply, and even more!						

codee

www.codee.com

info@codee.com

Subscribe: codee.com/newsletter/

USA - Spain

codee_com

company/codee-com/