Introduction to Parallel Programming with MPI and OpenMP

Online course, 12–15 April 2021

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Monday	10:00 – 12:00	Welcome
		Thinking Parallel I: computer architectures, programming models
		Laplace equation I: theory
	13:00 – 16:30	MPI: basic functions, communicators, messages, basic data types
		programming: *send* and *recv*
		MPI: point-to-point communication (send and receive modes)
		MPI: collective communication
		programming: ring I
Tuesday	10:00 – 12:00	Solutions to programming exercises
		MPI: datatypes
		MPI: reduction operations
		programming: ring II
	13:00 – 16:30	Laplace equation II: implementation with MPI
		Thinking Parallel II: performance considerations
		MPI topologies, MPI_Comm_split()
		programming: topologies
Wednesday	10:00 – 12:00	Solutions to programming exercises
		SHMEM and one-sided communication
		programming: *get* and *put*
		Parallel programming bugs
	13:00 – 16:30	MPI-IO
		programming: parallel output with MPI-IO
		Hybrid programming (MPI plus OpenMP)
		(programming: hybrid *hello world* program)
Thursday	10:00 – 12:00	Solutions to programming exercises
		Thinking Parallel III: finding parallelism, data dependence analysis
		OpenMP I
	13:00 – 16:30	Laplace equation III: implementation with OpenMP
		OpenMP II