Parallel Algorithm Models

Ways of structuring a parallel algorithm

Aspects of Model	
	• decomposition • mapping structure • minimizing interactions

Common Parallel Algorithm Techniques

Data-Parallel Model	: each task performs **similar operations on different data** • statically map tasks to processes • decomposition of data partitioning (uniform partitioning) • static mapping — different data, same computation • overlap computation-communication
Task graph model	: use **task-dependency graph** • dataset computation 균형 고려. • locality ↑ … • communication ↓ … static mapping
Master-Slave Model	: centralized dynamic mapping strategy • master threads generates works • slave threads operates allocated works static/dynamic … 상황 고려하여 결정! balanced! • Master communication bottleneck 대비! … slave computation >> communication
Pipeline / Producer-Consumer model	· pass a **stream of data** through **sequence of workers** overlapping !
Hybrid Model	• apply multiple models hierarchically • apply multiple models in sequence to different phases