

Parallel programming in Chapel

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slides and code examples at at ...

1D diffusion equation:

$$\frac{\partial T}{\partial t} = k \frac{\partial^2 T}{\partial x^2}$$

time derivative:

$$\frac{\partial T_i^{(n)}}{\partial t} \approx \frac{T_i^{(n)} - T_i^{(n-1)}}{\Delta t}$$

second-order spatial derivative:

$$\frac{\partial^2 T_i^{(n)}}{\partial x^2} \approx \frac{T_{i+1}^{(n)} - 2T_i^{(n)} + T_{i-1}^{(n)}}{(\Delta x)^2}$$

fully explicit finite-difference equation:

$$T_i^{(n+1)} \approx T_i^{(n)} + \frac{k\Delta t}{(\Delta x)^2} (T_{i+1}^{(n)} - 2T_i^{(n)} + T_{i-1}^{(n)})$$

Chapel base language

Task parallelism

Data parallelism

- one
- two

Advanced language features

- one
- two

- one
- two