

A complex-step method for tangent-stiffness calculation in a massively parallel computational peridynamics code

A. Goals: (Remaining)

- Confirm desktop results on Stampede cluster
- Meet or exceed the speed of Automatic Differentiation with Complex Step

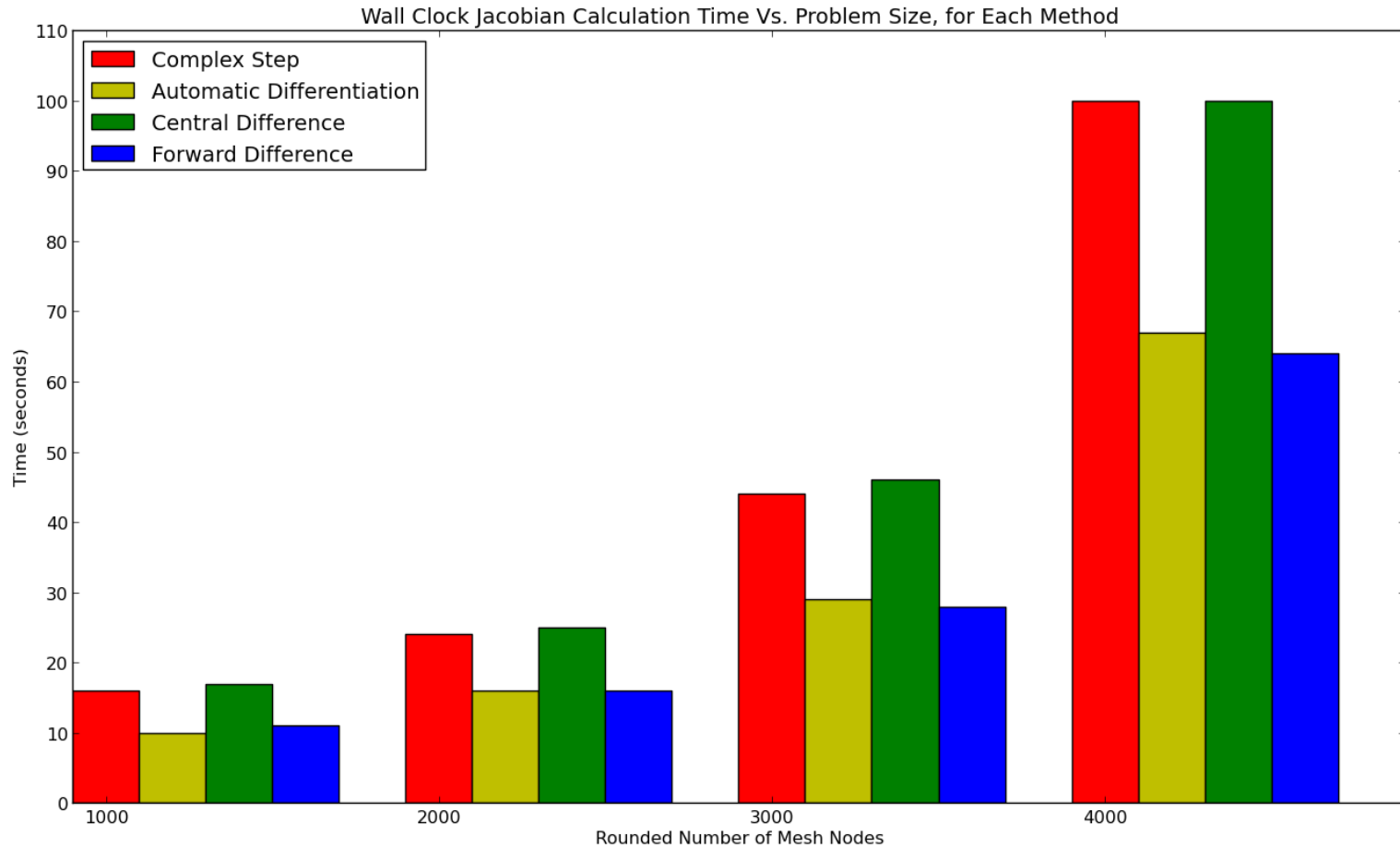
B. Brief Description:

- Complex step can calculate the first order partial derivatives needed to create a tangent stiffness matrix, and can be implemented in pre-existing solver code for superior accuracy over finite difference

C. Heights of Achievements this semester:

- Achieved accuracy superior to finite difference over a range of problem complexities
- Achieved performance similar to AD and finite difference over a range of problem complexities

Comparing Speed Performance



Comparing Accuracy Performance

