

Abstract Submitted
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A Simple and Efficient Parallel Implementation of the Fast Marching Method¹ JIANMING YANG, FREDERICK STERN, University of Iowa — The fast marching method is a widely used numerical method for solving the Eikonal equation arising from a variety of applications. However, this method is inherently serial and doesn't lend itself to a straightforward parallelization. In this study, we present a simple and efficient algorithm for the parallel implementation of the fast marching method using a domain decomposition approach. Properties of the Eikonal equation are explored to greatly relax the serial interdependence of neighboring sub-domains. Overlapping sub-domains are employed to reduce communication overhead and improve parallelism among sub-domains. There are no iterative procedures or rollback operations involved in the present algorithm and the changes to the serial version of the fast marching method are minimized. Examples are performed to demonstrate the efficiency of our parallel fast marching method.

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