The University of Alabama
Department of Computer Science
Colloquium Series Speaker

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IDEA Parallelization API — A Data Oriented Way to Parallelize Large Scale Spatial Computation

Wednesday, February 11th
11:00 a.m., EE 110

Abstract:
In our previous work, we verified the feasibility to automate the parallelization of large spatial computation on computing clusters. Based upon our established efficiency rules, we created an IDEA (Iteration and Dependency Aware) parallelization API. It provides a simple but powerful platform for scientists to automatically realize efficient data parallelization in their scientific computation. IDEA takes an explicit specification of application dependency pattern and produces appropriate data access patterns to reconcile the costs during the parallelization for overall application performance. The transparency of IDEA's data parallelization mechanism saves the scientist from many of the details of parallel spatial computation, letting them concentrate on the science. IDEA provides a novel data-oriented view of parallelization. Unlike other parallelization methods that require user's direct dealing with processor assignment or references, IDEA releases the user from such complex details by allowing them to initiate the communications, if necessary, through relative job block coordinates. Repartitioning of the data, if needed when application parameters change, would not require the user to change their codes. In this talk, I will talk about the design and structure of IDEA parallelization mechanism using ray casting as a motivating application.

Bio:
Baoqiang Yan is a PhD student at the University of Mississippi under the direction of **Dr. Philip J. Rhodes.**