

Integrating Task and Data Parallelism by means of Coordination Patterns

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This paper shows, by means of some examples, the suitability and expressiveness of a pattern-based approach to integrate task and data parallelism. Coordination skeletons or patterns express task parallelism among a collection of data parallel HPF tasks. Patterns specify the interaction among domains involved in the application along with the processor and data layouts. On the one hand, the use of domains, i.e. regions together with some interaction information, improves pattern reusability. On the other hand, the knowledge at the coordination level of data distribution belonging to the different HPF tasks is the key for an efficient implementation of the communication among them. Besides that, our system implementation requires no change to the runtime system support of the HPF compiler used. We also present some experimental results that show the efficiency of the model.