

## **Compositional Development of Parallel Programs**

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To appear at the *16th Workshop on Languages and Compilers for Parallel Computing (LCPC03)*, College Station, TX, 2-4 October 2003

### **Abstract**

This paper presents a programming model, a language (P-COM2) and a compiler that composes parallel and distributed programs from independently written components. P-COM2 is an interface definition language which incorporates information on behaviors and implementations of components to enable qualification of components for effectiveness in specific application instances and execution environments. The programming model targets development of families of related programs. One objective is to be able to compose programs which are near-optimal for given application instances and execution environments. Component-oriented development is motivated for parallel and distributed computations. The programming model is defined and described and illustrated with a simple example. The compilation process is briefly defined and described. Experience with one more complex application, a generalized fast multipole solver is sketched including performance data, some of which was surprising.