DSI Program Description

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ABSTRACT

The programming system **DSI**, being developed at Indiana University, is a basis for empirical investigations of programming and computer architecture. **DSI**'s development is motivated by a desire to explore in depth the applicative approach to programming. To do so, a pure and robust "computational medium" is needed, and **DSI** represents our model of such a vehicle. The program serves two projects. The first, called Project Alpha, has as an objective establishing a programming system on a conventional host computer, in order to experiment with applicative approaches to large problems. The goal of Project Beta is to specify, build, and measure a prototype applicative list multiprocessor.

This report is a "programmer's introduction" to **DSI**, giving an overall description of the program and reviewing the concepts that influenced its design. Discussion centers on the suspension, a transparent processing entity on which the program's design is based. An informal discussion of suspensions is followed by description of **DSI**'s overall program structure and a machine independent look at its representation of primitive objects.

To give orientation and perspective to the current state of **DSI**'s design, the remainder of the report deals with issues that guided its evolution and gives directions for further research and development. This includes a survey of related outside work as well as extensive references to material published by this department in the area of applicative programming. We conclude with a history of the implementation effort.