

- [54] **DEMAND BASED GENERATION OF SYMBOLIC INFORMATION**
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[57] **ABSTRACT**

A human oriented object programming system (HOOPS) and its debugger provide an interactive and dynamic modeling system to assist in the incremental generation of symbolic information of computer programs which facilitates the development of complex computer programs such as operating systems and large applications with graphic user interfaces (GUIs). A program is modeled as a collection of units called components. A component represents a single compilable language element such as a class or a function. One major functionality built on HOOPS is the debugger, using symbolic properties. The database stores the components and properties. The debugger, using a GUI, displays to the user the execution state of the program. To display the execution state in terms of the programmer's source code, the debugger demands retrieval and/or generation of the symbolic properties of the program. The compiler, which is responsible for calculating the dependencies associated with a component, uses those dependencies to generate the information stored in symbolic properties. The debugger matches versions of source and object code and retrieves source code configuration as needed. Symbolic properties that are stored in the database can be removed to reduce database and disk memory usage; they can be later reconstructed using the same method of demand-based generation of symbolic information.

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