

Electrical Engineering | Technology Offer

Processor with Integrated Real-Time Garbage Collection

Application Area

Object-oriented programming languages with garbage collection such as Java considerably increase programmer productivity and software quality. A novel processor with hardware extensions for garbage collection permits the use of these robust programming languages even in systems with hard real-time requirements.

Technological Challenge

While garbage collection offers substantial benefits for the design of highly reliable systems, it is extremely difficult to implement garbage collection both efficiently and suitably for real-time systems.

Today, garbage collection is exclusively realized in software and causes pauses of unpredictable duration or suffers from considerable runtime overhead. Because of these problems, most embedded system designers still consider garbage collection an unaffordable luxury.

Innovation

We present a novel processor with integrated real-time garbage collection for embedded systems. The processor autonomously performs garbage collection in hardware without any support from the compiler and the runtime system. In doing so, it completely hides dynamic memory management at the machine code level.

Researchers at the University of Stuttgart have implemented a hardware prototype of the garbage-collected processor. In conjunction with a prototype Java compiler, the system demonstrates the feasibility of the approach and may serve as a basis for a commercial implementation.

Your Benefits at a Glance

- Suitable for systems with hard real-time requirements (in particular embedded systems)
- Low garbage collection overhead
- No interruptions caused by garbage collection
- Extremely robust due to object-based memory protection
- Fully operational prototype (including a Java compiler)

Patent Portfolio

International patent applications in Korea, Japan and US

Granted Patents in Germany, France, Great Britain, Finland, China and Hong Kong.

Technology Transfer

The Technologie-Lizenz-Büro GmbH has been charged with the commercialization and offers companies the opportunity to obtain a license to exploit this new and promising technology.

For further information, please contact

Dr.-Ing. Florian Schwabe

TLB GmbH, Ettlinger Straße 25
76137 Karlsruhe, Germany
Tel. +49 721 79004-0
Fax +49 721 79004-79

fschwabe@tlb.de, www.tlb.de

Subject: "**Garbage Collector**"