



TECHNOLOGY

A Dynamic Memory Allocator for Embedded Systems with Scratch-Pad Memory

OVERVIEW

Developed by University of Maryland researchers, this invention is a method of allocating program data automatically in embedded computing systems containing scratch-pad memories. Compared to currently used compiler technology for embedded systems, this new method reduces time, power consumption, programmer burden and cost.

This technology has applications as a memory allocation tool for use in a compiler and as a hardware design tool. It can improve embedded processor boards of all types, a growing and lucrative market.

Embedded computing systems are computing processors in devices other than dedicated computers. Compilers for embedded systems produce executable code for embedded processors from source-level computer programs.

The primary novelty of the invented method is that it is able to allocate all kinds of global and stack variables in programs to scratch-pad memory using a dynamic method other than software caching. A dynamic method is one where the allocation of variables in memory is allowed to change during the run of the program.

Compared to present-day hardware design tools, this technology, when used to predict the smallest size of scratch-pad memory that meets runtime requirements, can reduce the size of scratch-pad memory required, resulting in reduced hardware cost.

Compared to using hardware caches, this technology allows for better utilization of scratch-pad memories, which have inherent advantages over caches in terms of cost, power consumption and access time. This technology allows scratch-pad memories to live up to their full advantageous potential.

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Additional Information

INSTITUTION

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PATENT STATUS

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CATEGORIES

- Information Technology

EXTERNAL RESOURCES

- [US Patent 7,367,024](#)

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