



## TECHNOLOGY

# Data Hiding in Compiled Program Binaries for Enhancing Computer System Performance

## OVERVIEW

Various techniques for reversible data embedding and lossless compression exist, such as those used for multimedia data. Certain of these algorithms use additive spread spectrum techniques while others embed supplemental data by modifying selected features, such as the Least Significant Bit (LSB) of the host signal. These techniques cannot be directly applied to program binaries because of the inherent differences between multimedia data and program instruction data. Modification of program data by compression techniques such as the Lempel-Ziv and arithmetic coding schemes, for example, require a priori knowledge of the execution order of the instructions and are not suitable for supplementing system functionality where instruction ordering cannot be relied upon.

The present invention advantageously applies information hiding techniques to program binaries of fixed-width instruction set processors, whereby extra information is transparently embedded. The supplemental information can be extracted by the processor at very low cost in a manner that supplements computer system functionality. The invention stores and extracts the additional information in computer programs in an ISA-independent way and without inserting extra instructions. The embedded data may be used in a variety of ways, such as for value and branch prediction in pipelined instruction execution, as well as to validate the integrity and origin of a program in trusted computing environments.

For licensing information please contact the Office of Technology Commercialization 301 405 3974.

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## Additional Information

### INSTITUTION

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### PATENT STATUS

Patent(s) pending

### LICENSE STATUS

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## **CATEGORIES**

- Information Technology

## **EXTERNAL RESOURCES**

- [US Patent 7,840,789](#)

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