



Method Predicts Porting Speedup

[View U.S. Patent No. 9,384,016 in PDF format.](#)

WARF: P140165US01

Inventors: Karthikeyan Sankaralingam, Newsha Ardalani, Xiaojin (Jerry) Zhu

The Wisconsin Alumni Research Foundation (WARF) is seeking commercial partners interested in developing a method of estimating the amount of speedup that will be obtained from porting a program between two different processor units, for example, between a CPU and a GPU.

Overview

High-performance computers may employ two processor systems having very different architectures, such as a CPU (computer processing unit) and a GPU (graphic processing unit). The ability of a GPU to handle not only graphics tasks but also general tasks in parallel has led to “heterogeneous processing” in which the GPU takes over tasks normally performed by the CPU. Some programs speed up when moved (“ported”) from the CPU to a GPU.

However, porting a program requires substantial restructuring of the software and data organization. Code optimization of such ported programs can be very time consuming and require specialized tools and expertise. Given these costs, it would be advantageous to know if the amount of speedup will justify the effort. Currently, this cannot be known until after the fact.

The Invention

UW–Madison researchers have developed a method of assessing the benefits of porting a program before the effort and cost of porting are undertaken. In other words, the amount of speedup can be predicted in advance.

In the new method, a computer measures multiple quantifiable execution properties of a given program. These properties describe how the program executes on a first processor system (e.g., a CPU). Next, the properties are applied to a model that estimates the change in speed that will occur if executed on a second processor system (e.g., a GPU).

Applications

- Performance-predicting software

Key Benefits

- Assesses porting costs ahead of time
- Saves time and resources
- Does not require detailed instrumentation or specialized knowledge
- Works with a wide variety of different processors and programs

We use cookies on this site to enhance your experience and improve our marketing efforts. By continuing to browse without changing your browser settings to block or delete cookies, you agree to the storing of cookies and related technologies on your device. [See our privacy policy.](#)

OK



WARF
Wisconsin Alumni Research Foundation

| info@warf.org | 608.960.9850

Promising simulations have been performed using industry accepted benchmarks and studies on three different GPU platforms show the method works and produces highly accurate predictions.

Additional Information

For More Information About the Inventors

- [Karthikeyan Sankaralingam](#)
- [Xiaojin \(Jerry\) Zhu](#)

Related Technologies

- [WARF reference number P120164US01 describes a more efficient, portable graphic processing system by exception handling.](#)

Tech Fields

- [Information Technology : Computing methods, software & machine learning](#)

For current licensing status, please contact Jeanine Burmania at jeanine@warf.org or 608-960-9846

We use cookies on this site to enhance your experience and improve our marketing efforts. By continuing to browse without changing your browser settings to block or delete cookies, you agree to the storing of cookies and related technologies on your device. [See our privacy policy.](#)

OK



WARF
Wisconsin Alumni Research Foundation

| info@warf.org | 608.960.9850