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	Redesign' Urged for Future Computers				
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	'Radical Redesign' Urged for Future Computers	**01/29/2011**	**PC World - Online**	**Joab Jackson**	

News Headline: Research: Computers Need Radical Redesign |

News Date: 01/31/2011
Outlet Full Name: CIO India
Contact Name:
News Text: Joab Jackson, IDG News Service

To use multicore processors effectively the IT industry needs to radically rethink the basic computer architecture it has used over the past 50 years, a University of Maryland researcher argues in the January edition of the Association for Computing Machinery's flagship Communications publication.

"The recent dramatic shift from single-processor computer systems to many-processor parallel ones requires reinventing much of computer science to build and program the new systems," argues Uzi Vishkin, a professor at the University of Maryland Institute for Advanced Computer Studies, in the paper.

Vishkin even offers a new architecture abstraction, which he calls ICE (Immediate Concurrent Execution), and which he developed with funding from the U.S. National Science Foundation.

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This approach allows what Vishkin calls serial computing, a design in which "any single instruction available for execution in a serial program executes immediately."

But it is limited because it allows only a single instruction to be executed at a time. In an age of multicore processors and large amounts of available memory, this limit is no longer necessary, Vishkin argues. Instead, multiple instructions can often be executed much faster in parallel -- all at the same time and in a single step.

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Such an architecture, Vishkin states, would require changes in hardware design. For the approach to operate, the chips would require a high-bandwidth, low-latency network between the processors and memory. The hardware would have a single processor core to control all the other cores. If the code is serial, it can be executed on that core. If there are additional instructions, the central processor can dole out additional instructions to the other cores.

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News Headline: Computers need radical redesign for multicore chips |

News Date: 01/31/2011
Outlet Full Name: Computerworld UK
Contact Name:
News Text: IT industry needs to radically rethink the basic computer architecture it has used over the past 50 years to use multicore processors effectively.

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computer architecture it has used over the past 50 years, a University of Maryland researcher argues in the January edition of the Association for Computing Machinery's flagship Communications publication.

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News Date: 01/31/2011
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Infrastructure | 31 Jan 2011 : IT industry needs to radically rethink the basic computer architecture it has used over the past 50 years to use multicore processors effectively.

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News Date: 01/30/2011
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News Date: 01/30/2011
Outlet Full Name: Computerworld Philippines
Contact Name: Fei Lumbania
News Text: By Joab Jackson
IDG News Service (New York Bureau)
January 31, 2011

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But it is limited because it allows only a single instruction to be executed at a time. In an age of multicore processors and large amounts of available memory, this limit is no longer necessary, Vishkin argues. Instead, multiple instructions can often be executed much faster in parallel -- all at the same time and in a single step.

Vishkin's alternative varies the von Neumann architecture by allowing an indefinite number of instructions to be executed at any given time, which could greatly simplify matters for programmers. With ICE, "You could dream up any number of instructions as long as the input for one is not the output for the another," he said. The programmer wouldn't have to worry about how many processors would be available for the task.

Such an architecture, Vishkin states, would require changes in hardware design. For the

approach to operate, the chips would require a high-bandwidth, low-latency network between the processors and memory. The hardware would have a single processor core to control all the other cores. If the code is serial, it can be executed on that core. If there are additional instructions, the central processor can dole out additional instructions to the other cores.

Vishkin has six patents on the technology and the research team built prototype hardware to run on the ICE abstraction.

Networks Asia Staff

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News Headline: Research: Computers need radical redesign |

News Date: 01/30/2011
Outlet Full Name: TechWorld Australia
Contact Name:
News Text: To use multicore processors effectively the IT industry needs to radically rethink the basic computer architecture it has used over the past 50 years, a University of Maryland researcher argues in the January edition of the Association for Computing Machinery's flagship Communications publication.

"The recent dramatic shift from single-processor computer systems to many-processor parallel ones requires reinventing much of computer science to build and program the new systems," argues Uzi Vishkin, a professor at the University of Maryland Institute for Advanced Computer Studies, []. Vishkin even offers a new architecture abstraction, which he calls ICE (Immediate Concurrent Execution), and which he developed with funding from the U.S. National Science Foundation.

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News Headline: 'Radical Redesign' Urged for Future Computers |

News Date: 01/29/2011
Outlet Full Name: PC World - Online
Contact Name: Joab Jackson
News Text: To the technology industry needs to radically rethink the basic computer architecture it has used over the past 50 years, a University of Maryland researcher argues in the January edition of the Association for Computing Machinery's flagship Communications publication.

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