Contact: Melissa Power, Interprose for IEEE
+1 401-454-1314 | melissa.power@interprosepr.com

IEEE Rebooting Computing Supports National Strategic Computing Initiative

Multi-agency strategic vision and Federal investment strategy in high-performance computing matches IEEE RC's mission and vision for industry

PISCATAWAY, NEW JERSEY, USA, 1 September 2015 – IEEE, the world's largest professional organization dedicated to advancing technology for humanity, today announced that the IEEE Rebooting Computing (RC) initiative is enthusiastically welcoming and supporting the Obama Administration's National Strategic Computing Initiative (NSCI)—a Federal investment strategy in high-performance computing (HPC).

"The IEEE RC initiative was created in 2012 to restore computer performance to its historic exponential growth. Using microprocessors as an indicator of computational progress, one can see that performance improved 3,000 times from the mid-80s to about 2005. This was largely accomplished by increasing operational frequency, pipelining, and speculative instruction-level parallelism," said Thomas M. Conte, professor for the Schools of Computer Science and Electrical & Computer Engineering at Georgia Institute of Technology, IEEE Computer Society's 2015 president and co-chair of IEEE RC.

*"*Aggressive scaling down of transistor size reached its practical limits in the middle of the last decade, effectively halting computer performance. It's imperative that we restore computing performance to its original scaling trends so it collectively enhances the lives of every human being on this planet. We believe creating the NCSI is an essential and absolutely significant step towards achieving this goal," continued Conte.

IEEE RC is an initiative that proposes to rethink the computer through a holistic look that addresses all aspects of computing. Through exponential performance scaling, IEEE RC aims to help the computing industry turn the corner to surpass its current setbacks and challenges—specifically regarding the deceleration of computational power and capacity. Because the research and exploration of new computational paradigms represents a major and unprecedented challenge, the academic and industrial efforts need to be augmented and synchronized via a Federal investment strategy maximizing the probability that the benefits of HPC to society will continue in the next decade and beyond.

By Executive Order, the NSCI was created to be a "whole-of-government effort designed to create a cohesive, multi-agency strategic vision and Federal investment strategy executed in collaboration with industry and academia, to maximize the benefits of HPC for the United States."

The NSCI is centered on five strategic themes: (1) Create systems that can apply exaflops of computing power to exabytes of data, (2) Keep the United States at the forefront of HPC capabilities, (3) Improve HPC application developer productivity, (4) Make HPC readily available, and critically, (5) And to establish new hardware technology for future HPC systems. It is the last of these goals that is the hardest.

In partnership with International Technology Roadmap for Semiconductors 2.0 (www.itrs2.net), the IEEE RC has hosted two meetings at Stanford University to discuss new approaches to future computing. As part of the annual summer meeting in July, the ITRS 2.0—with assistance from IEEE RC—further developed its computing roadmap via the support of its International Focus Teams. The roadmap follows seven focus topic areas, including system integration, overall system connectivity, heterogeneous components, beyond CMOS, more Moore, and factory integration. A preliminary draft of the roadmap is available here.

"We all agree that, even though the number of transistors has continued to grow according to Moore's Law, CMOS technology has reached severe power limitations that have reduced its contributions to computational performance," said Paolo A. Gargini, ITRS 2.0 chairman. "The new NSCI puts weight and momentum behind these activities of IEEE RC and ITRS 2.0 to drive computing performance to the next level. It will absolutely guarantee that demonstrations and implementations of new computing paradigms will be successful. With that in mind, cloud and data centers, the Internet of Things, and personal devices will exponentially grow the industry. We need to be prepared to have computing technology and resources that scale with it all."

Become a member of the IEEE RC initiative and help pave the way to the future of computing by supporting new technology, applications, investments, and international cooperation. Join today! For more information on IEEE RC events, visit http://rebootingcomputing.ieee.org/conferences-events.

To learn more about IEEE RC, visit rebootingcomputing.ieee.org. Join the IEEE RC virtual communities: follow us @IEEERebootComp, like us on Facebook, and connect with us at the IEEE Rebooting Computing LinkedIn Group.

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