



Published on *The Green500* (<http://www.green500.org>)

[Home](#) > [Printer-friendly PDF](#)

About

Energy is as Important as Performance

About The Green500

The purpose of the Green500 is to provide a ranking of the most energy-efficient supercomputers in the world. For decades, the notion of "performance" has been synonymous with "speed" (as measured in FLOPS, short for floating-point operations per second). This particular focus has led to the emergence of supercomputers that consume egregious amounts of electrical power and produce so much heat that extravagant cooling facilities must be constructed to ensure proper operation. In addition, the emphasis on speed as the ultimate metric has caused other metrics such as reliability, availability, and usability to be largely ignored. As a result, there has been an extraordinary increase in the total cost of ownership (TCO) of a supercomputer.

In order to raise awareness to other performance metrics of interest (e.g., performance per watt and energy efficiency for improved reliability), the Green500 offers lists to encourage supercomputing stakeholders to ensure that supercomputers are only simulating climate change and not creating climate change.

History of The Green500

Historically, the Green500 started back in April 2005 – after a keynote talk by Dr. Wu-chun Feng at the IEEE IPDPS Workshop on High-Performance, Power-Aware Computing. The notion was then formally proposed a year later at the aforementioned workshop with a paper and associated talk entitled "Making a Case for a Green500 List," [[paper](#)] [[talk](#)]. A subsequent presentation at Clusters and Computational Grids for Scientific Computing 2006, "[Global Climate Warming? Yes ... In The Machine Room](#)," led to more fervent interest, and ultimately, the announcement of the Green500 at SC|06. One year later at SC|07, the inaugural list was released and a new era of Green Supercomputing began.

Lead Investigators



Dr. Wu-chun Feng

Wu-chun Feng, or simply "Wu", is an associate professor of Computer Science with a courtesy appointment in Electrical & Computer Engineering at Virginia Tech (VT). At VT, he directs the Synergy Laboratory, which conducts research at the synergistic intersection of systems software, middleware, and application software; of particular note is his high-performance computing (HPC) research in the areas of green supercomputing, accelerator-based parallel computing, and bioinformatics. Prior to joining VT, he spent seven years at Los Alamos National Laboratory, where he began his journey in green supercomputing in 2001 with *Green Destiny*, a 240-node supercomputer in 5 square feet and consuming only 3.2 kW of power when booted diskless. This work ultimately created the impetus for the Green500.

Previous professional stints include The Ohio State University, Purdue University, University of Illinois at Urbana-Champaign, Orion Multisystems, Vosaic, IBM T.J. Watson Research Center, and NASA Ames Research Center. Over this professional career, he has published more than 150 peer-reviewed manuscripts, and his work has been featured in media outlets such as The New York Times, CNN, and BBC News. He has received numerous awards and accolades for his research, including five Best Paper Awards, two IBM Faculty Awards, and a NVIDIA Professor Partnership Award.

He received a B.S. in Electrical & Computer Engineering and in Music (Honors) in 1988 and an M.S. in Computer Engineering from the Pennsylvania State University in 1990. He earned a Ph.D. in Computer Science from the University of Illinois at Urbana-Champaign in 1996. He is a senior member of the IEEE and was listed on HPCwire's Top People to Watch List in 2004.



Dr. Kirk W. Cameron

Kirk W. Cameron is an associate professor of Computer Science at Virginia Polytechnic Institute and State University. Professor Cameron received the B.S. in Mathematics from UF in 1994 and the Ph.D. in Computer Science from LSU in 2000. He directs the SCAPE Laboratory at Virginia Tech where he pioneered the area of Green HPC to improve the efficiency of high-end systems. Cameron has received numerous awards and accolades for his research and publications including the NSF Career Award (2004), the DOE Career Award (2004), USC COE Young Investigator Research Award (2005), Best Paper Nominee (SC06), VT COE Fellow (2007), IBM Faculty Award (2007), Uptime Institute Fellow (2008), and was invited to the 2008 National Academy of Engineering Symposium. Prof. Cameron is on the editorial board and editor for the IEEE Computer "Green IT" column. He is an active consultant for the

Energy Star program for Servers and a founding member of SPECPower, the first and foremost industry benchmark for power and performance.

Green500 Contributors

Tom Scogland, VT
Balaji Subramaniam, VT

Additional Support

Heshan Lin, VT

Past Contributors

Ashwin Aji, VT;
Jeremy Archuleta, VT;
David H. Bailey, LBNL;
Hung-Ching Chang, VT;
Vineeta Chaube, VT;
Jack Dongarra, U. Tennessee & ORNL;
Mark K. Gardner, VT;
Jacob George, VT;
Yang Jiao, VT;
Ajit Kulkarni, VT;
Dong Li, VT;
Harshil Shah, VT;
John R. Shalf, LBNL;
Horst Simon, LBNL;
Erich Strohmaier, LBNL;
Shuaiwen (Leon) Song, VT;
Joseph Turner, VT

©2007-2013 CompuGreen, LLC. Green500™ and the Green500™ logo are trademarks of CompuGreen, LLC. All rights reserved.

Source URL (retrieved on 09/19/2015 - 23:43): <http://www.green500.org/about>