



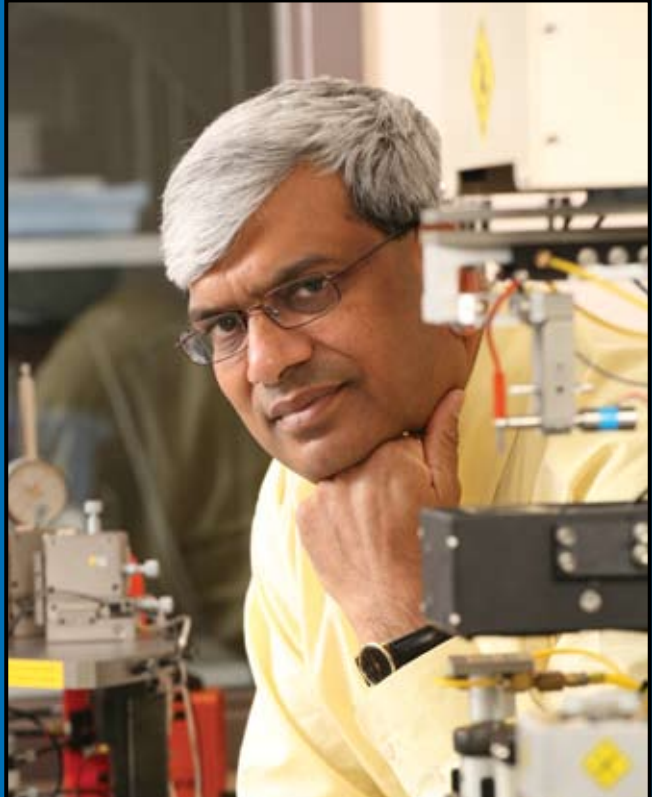
Digital Power Chip Could Save the Computer Industry Millions of Dollars Each Year

Hardware failures caused by thermal stress or the overheating of components presents a major challenge for computer manufacturers.

It also represents a significant business opportunity for CHiL Semiconductor a new spinoff company from Queen's University that has developed innovative microsystems technology to address this problem.

"Our team benefits from tools and technologies provided by CMC on several projects. Access to this capability increased the commercial potential of this research. There are about 400 million computer and graphics processors in the market every year and this new power management chip could be used in all of those processors. This represents a billion dollar market opportunity."

Dr. Praveen Jain
Professor and Canada Research Chair in Power Electronics Electrical and Computer Engineering
Queen's University



Dr. Praveen Jain of Queen's University has developed a digital power chip that helps to reduce hardware failures caused by thermal stress or the overheating of components inside computers.

In 2002, Dr. Praveen Jain, Professor and Canada Research Chair in Power Electronics, Electrical and Computer Engineering, sought guidance from CMC about the equipment he would require to set up a state-of-the-art power electronics facility at Queen's University. In 2003, CFI awarded the researcher \$3 million for the development of the Power Electronics Laboratory for Designing Integrated Architectures for Computers and Telecommunications Systems. This was augmented by \$400,000 in operating funds from Communications and Information Technology Ontario (CITO). CMC equipped him with the design tools and FPGA (Field Programmable Gate Array)-based prototyping platforms to conduct leading-edge microsystems research in this lab.

Dr. Jain put these tools to work by developing a digital power chip that addresses the problem of component strain and failure that is caused by increasing computer speeds and heat in these systems. Leveraging new power conversion techniques, they designed a chip delivers power-on-demand to computer processors instantaneously without the need for bulky and costly capacitors that store power and regulate voltage inside a computer. The innovation represents a new integrated power solution for semiconductors. Going forward, the team aims to develop an entire power system-on-chip.

Building on the outcomes of this initial research, Dr. Jain launched CHiL Semiconductor in 2006, a startup company with over 30 employees based in Ottawa, Ontario and Tewksbury, Massachusetts. The entrepreneurial researcher has already raised over \$US15 million from top-tier venture capital firms in Boston and Taiwan.

"This represents a completely new research area for our team. We specialize in power electronics. We are not silicon design people. Access to products, services and engineering expertise from CMC was a critical to the success of this project," says Dr. Jain. [cmc](#)