THE FUTURE OF ELECTRONIC GAMES AND
THE IMPACT ON DESIGN AUTOMATION

Description: The electronic games phenomenon permeates our culture, evidenced by the fact that some 60% of all Americans -- more than 145 million people -- play computer and video games. It's serious business, it's growing, and it's here to stay. After the birth of Spacewar and Pong nearly 40 years ago, the games industry experienced an explosion in growth. The primary drivers of this extraordinary change have been the gamers' unquenchable desire for more realism, interaction, and mobility. To meet that market demand, the hardware developers were motivated to crank up the speed and bandwidth of the processor, increase the memory size and access time, and decrease power consumption -- all of which have serious implications for design automation. Today, correctly configured PCs and game consoles are a game developer's dream. With professional graphics engines handling the calculations to create the graphics, the microprocessor is left to focus on the calculations to create characters that behave more like real people and gaming environments that are more intense. DVD formats allow developers to include a deeper story line, richer graphics, sound, and video.

The future holds many challenges for the games industry. New technologies are required to be able to handle speech recognition, handwriting recognition, artificial intelligence, and video and audio streaming. Developers will consume every FLOP and memory byte available to make games that can provide automated generation of environments and characters. Wireless games will become more refined, and mobility will take on increased significance. Probably the most noteworthy trend will be the move toward broadband entertainment centers. Without a doubt, the impact on processor development, tools development, and design automation will be as enormous.

Until recently, wires have kept pace with transistors in scaled designs. The ITRS roadmap and our own experience shows that this is no longer true. This means that design systems have to give much more attention to wires. Doing so turns synthesis upside down, focusing on interconnect delays not just logic depth.

In the past, performance was most critical out of the triple constraints of performance, area and power. Today power is number one, while performance requirements must still be met. In other designs, performance is traded off for lower power but this is not possible for the electronic game industry because a certain amount of work is required to meet the "real time" performance requirements. In this new low power electronic game industry, new tools and methodologies for power management are necessary along with a higher emphasis on power savings from chip designers and architects. These tools range from power prediction to power grid distribution analysis. They provide critical feedback for designers to make proper choices in the design.

Biography
Chekib Akrout graduated with a BS in Physics from the University Pierre & Marie Curie in France, and then went on to obtain his PhD in Electronics and Physics. He joined IBM in 1982, where he worked on the bipolar high speed SRAM, then CMOS Cache Design for a high speed microprocessor. He managed several areas from microprocessors to ASICs to analog mixed signal design. At the present, Chekib is Director of high speed and broadband microprocessor development in IBM's Microelectronics Division, where he is responsible for PowerPC processors for Apple Macintosh and Nintendo Game Cube. He is also responsible for the Cell Project being developed through a Sony/Toshiba/IBM partnership in Austin, Texas.