Computer and communication applications are shifting from tethered systems to mobile systems. There will be at least two big consumer markets: mobile handheld appliances (consumer appliances like wireless communication systems, cellular and video phones, MP3 players, global positioning systems, digital cameras, personal digital advisors etc.), and vehicular mobile systems (electronics in automotive industry, in addition to traditional consumer appliances, wireless Internet access points, vehicular ad hoc networks; car engine and break control systems).

These new applications present new challenges for designers: mobile devices must be multifunctional, provide high computational performance and be very energy efficient. The traditional microprocessors and digital signal processors can't meet these requirements because of the low computational efficiency: relatively low performance and high power consumption. Also, the computationally efficient designs based on application specific integrated circuits (ASICs) can't meet these requirements either, because of their inflexibility for multifunctional use. Thus, the new applications demand a new hardware technology.

The recent advances in wireless computing systems and research for suitable architectural solutions have emphasized the ideas behind configurable or adaptive computing platform-adaptive hardware architecture-which aims at implementing algorithms in a computational space consisting of a huge number of elementary computing cells. This computational space can be configured, or adapted, for solving a given problem. The adaptive computing approach integrates the flexibility of programming conventional computers, with the efficiency of dedicated hardware devices on ASICs. Adaptive computing platform has intensively considered as a new prospective architecture for mobile systems.

One important issue, which arises in this context, is the design method. One reason for the great success of microprocessor based designs in embedded systems during the last thirty years has been the fact that, in this case, the problem solving is programming. Solutions that based on hardware design and require logic design skills are expensive and long-term projects. The configurable computing approach intends to turn the hardware design into programming using standard programming languages as C/C++, which reduces the design time and reduces dramatically the design cost. Also, there are ten times more programmers than hardware designers in the world.

The mobile computing together with reconfigurable computing has becoming an innovative trend in hardware designs and is an important area of active scientific research.

This year's MOCHA Design symposium presents several published research papers; and discussion papers and talks, not published in the present proceedings. Along the traditional design problems and issues, which address the optimal design problems of mobile wireless communication systems, the Mocha Design Symposium addresses new approaches and problems which have emerged during last few years. These are security problems and reconfigurable multi-core processors or multiprocessors, which add the flexibility into design.