Title: The Future Computing, Part 1: The scalable hardware
Part 2: Large Scale Computing

Abstract: The domain of computer science and engineering has known many important mutations from ordinary to large scale computing since the emergence of the information and communication technologies. Already prepared for these huge changes, the computer science industries have rapidly reacted by manufacturing supercomputers and developing intensive computing. For instance, Google current search engines seek hundreds of millions of web pages to respond to millions of queries daily. Thanks to the supercomputer including Thousands of processors that treats this tremendous volume of data. In absence of such sophisticated device, complexity theory is critically examined for this category of applications. This talk first introduces the necessity of the scalable computing by explaining how polynomial complexity is not sufficient enough to handle large scale problems with ordinary machines.

In the first part of the speech, I focus on the use of scalable devices such as supercomputers, grid or cloud computing. A detailed presentation of supercomputers technologies is provided. Examples from industries and universities are given and discussed. On the other hand the other alternatives of extreme hardware that are grid and cloud plate-forms are also examined and compared.

In the second part, a promising software direction to overcome the scale issue is provided. I will first present the Bees Swarm Optimization (BSO) meta-heuristic I published with my research group in 2005 and its applications to academic problems such as satisfiability, to an industrial real world application such as the frequency assignment problem and to web context such as information retrieval. For the latter, classical information retrieval will be reviewed then new algorithms with parallel versions based on BSO are suggested. The challenge of coping with complexity of large scale information retrieval is discussed. Several directions proposed in the recent literature to tackle this issue such as personalizing information retrieval, document clustering and knowledge based information retrieval are pointed out. A novel practical system based on hybrid BSO and clustering is presented through its design and implementation with speedup results.

Biography: Habiba Drias received the M.S. degree in computer science from Case Western Reserve University, Cleveland Ohio USA in 1984 and the Ph.D. degree in computer science from USTHB, Algiers, Algeria in collaboration with UPMC, Paris6, France, in 1993. She is a full professor at USTHB since 1999 and directs the Laboratory of Research in Artificial Intelligence (LRIA). She has conceived recently a M.S. program on intelligent computer systems of which she is responsible. Previously she was the head of the Computer Science Institute of USTHB from 1995 to 1998 and the general director of the Algerian National Institute of Informatics –INI- from 2003 to 2008. Besides she conducted 6 national research projects and 3 international ones (CMEP and CNRS).
Her research was primarily focused on the satisfiability problem and then on artificial intelligence technologies. She has a wide international experience in the domain of computational intelligence and more precisely in agent technology and meta-heuristics. She has worked on satisfiability, multi-agent systems, taboo search, scatter search, genetic and memetic algorithms, guided local search and bio-inspired approaches such as ACO and PSO. She is the author of Bees Swarm Optimization (BSO) published in 2005. More recently, her research investigations include intelligent data mining and large scale and knowledge-based information retrieval. She has published since 1992 around 150 papers in well recognized international conferences and journals (50 in journals and 100 in conference proceedings) and has been advisor of 11 Ph. D. Theses, 41 master theses and 31 engineer projects. On the other hand, she has attended many international conferences in artificial intelligence from all the continents and has organized many national conferences. Recently she has been the General Chair of the International Conference on Machine and Web Intelligence ICMWI'2010 technically co-sponsored by IEEE Communication Society and whose proceedings appear in IEEE Xplore Library. She has also served on program committees for national and international conferences. She is currently guest editor of the Special Issue on "Intelligent Operations Management and Global Business Services" 2011 of the **International Journal of Advanced Operations Management (IJAOM).**