

11:45 Modélisation et commande de réseaux de télécommunication à large échelle
Modeling and control of large scale telecommunication networks

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We witness today the advent of a digital era where the IT and broadband communications create a new economy and shape the behavior of a new society. In this context, fixed and mobile multimedia networks take an unprecedented importance with the convergence of heterogeneous access technologies and the virtualization of services. The control and design of such systems require large scale integrated approaches, spanning from the detailed modeling of stochastic processes, up to resource management and dynamic engineering of networks:

modeling of subscribers behavior, applications and traffic sources, estimation of traffic matrices, optimization of network topologies, capacity planning, management of the quality of service, design of, static or dynamic, resilient routing policies.

In this talk, we present a synthesis of some works carried out at LAAS-CNRS on these issues, and in particular, selected contributions related to the techniques of differential and hybrid modeling, queuing networks, mixed non-linear optimization and Metaheuristics.

Jean-Marie Garcia has obtained his Engineer degree in 1976 at INSA, Toulouse. He then got a "Master of Applied Sciences" degree from the University of Montreal in 1978, and conducted research activities at Hydro-Québec research center. He obtained his PhD at LAAS in 1980. Then he became in turn research fellow at the University of California, Berkeley, and research associate with France Telecom R&D at CNET. He then joined LAAS as a CNRS research staff member in 1981, where he was successively responsible for the research groups "Parallel Algorithms in Control, Optimisation-Filtering" and "Parallelism and Telecommunication Networks and Systems". Subsequently, he became Scientific Director of the *Delta Partners* company. Since 2004, he is the founding director of the startup company *QoS Design* that was awarded several Innovation prizes. Jean-Marie Garcia is currently a Research Director with CNRS (delegated by CNRS with *QoS Design*).

His research interests encompass stochastic modeling, traffic and queuing theory, telecommunications, optimization and control of large scale systems, scientific computation on clusters and grids. He is the author of more than 100 papers and advised about twenty doctoral theses. He conducted numerous academic and industrial collaborative research projects with telecommunication research centers such as ATT, Vodafone, British Telecom, France Telecom R&D, SFR, as well as with several key players in the field (Alcatel, Nortel, Ericsson...).