

# Biography of Abdelhaq El Jai

Born in Fez, Morocco, on July 14, 1948, Abdelhaq El Jai received his high school diploma (baccalauréat) from Lycée Lyautey in Casablanca, Morocco, in 1967 and got his bachelor in pure mathematics and applications from University Paul Sabatier, Toulouse, France, in 1971. After his master of Science (DEA) in 1972, he received his Ph.D degree in Applied Mathematics and Automatic Control from Paul Sabatier University (Laboratory of Automation and Systems Analysis, LAAS - CNRS) in July 1978.

His research-scholar carrier started in 1971 as an assistant at the University Paul Sabatier in Toulouse, France. Later, he moved to Morocco and worked in as Lecturer and then professor in the Faculty of Science at Mohamed V University in Rabat, remaining until 1984. Finally he moved back to France where he was appointed Professor at University of Perpignan. When he retired on July 2013, he became Emeritus Professor and still maintains a good research activity in his laboratory IMAGES, UMR ESPACE-DEV at University of Perpignan.

He created and led the first optimal control laboratory at University Mohammed V in Rabat (Morocco, 1981-1985). This laboratory allowed the training of several doctors. Its activity was supported by numerous scientists and scientific projects. Several eminent scientists who collaborated with Professor El Jai, brought their support by their lectures, supervision of researchers work, by receiving researchers in their labs, supports to scientific programs, thesis defence, etc. His former doctoral students and researchers are mostly professors in Moroccan or foreign universities. Some of them are today leaders for about ten research laboratories in systems theory through Morocco. These laboratories are connected within a research network (Systems Theory Network) created and coordinated by Professor El Jai with the support of the Academy Hassan II of Sciences and Technology in 2007. Indeed, since May 2006, Professor El Jai was appointed resident member of the Hassan II Academy of Science and Technology, where he now leads the college "Sciences de la modélisation et de l'information ». Several research or extension activities have been carried out with the support of the Hassan II Academy of Science ranging from the organization of bi-annual workshops around Moroccan universities to "La caravane de la Science" in 2012 with the assistance of the "Palais de la Découverte".

He later directed the group "Automatique" within the laboratory of automation, IMP-CNRS (1992-1997) and then he created and directed the laboratory of Systems Theory at University of Perpignan (1997-2003).

He is a pioneer of the research and training in systems theory in Morocco since he has initialized and strongly contributed to the creation of the first licence (Bachelor) of applied mathematics in Morocco in 1979 and then a CEA (Master) of Optimal Control in 1980 in the Faculty of Sciences at Mohamed V University in Rabat. For this purpose, he was very much encouraged and supported by two great mathematicians late Professor J. L. Lions (Collège de France) and late Professor Anthony J. Pritchard (University of Warwick, GB). He also strongly influenced the

research training in France where he took the whole responsibility in DEA "Processes, Materials and Systems" in Perpignan (1997-2003).

His research area was devoted to the modelling, analysis and control of systems mainly for distributed parameters systems (DPS), not only from a theoretical point of view. He was also convinced that the mathematical abstraction in systems theory remains quite difficult and have to be motivated and connected to applications which now cover more and more areas ranging from engineering to life sciences and environment in the case of DPS. He conducted a very interesting research activity keeping in mind a strong relationship between fundamental and applied sciences.

He has organized several meeting, symposiums, international conferences, IFAC 1989, France, MTNS 2000, France or Fez 2009, Morocco to name a few. He wrote and co-edited a dozen books and over a hundred of high level publications and papers in several prestigious conferences.

Professor El Jai research cover a variety of topics in the theory of distributed parameters systems. His focus was first mainly on the concepts of sensors and actuators in distributed systems. He developed a wide study on the optimization of actuators and sensors structures and their relation with the controllability and observability notions. He wrote a famous introductory book on the subject with late Anthony Pritchard. Some innovative ideas on regional analysis and control, spreadability and spray controls, vulnerability and protector controls, detectability, remediability, domination concept etc. have been introduced under his guidance, from Moroccan researchers. All these activities were motivated by real spatio-temporal phenomena arising in engineering, environmental or ecological systems.

He also contributed to many innovative extensions of these concepts by working on the development of new methodological approaches for distributed parameters systems. In this context, he contributed to the introduction of cellular automata models as an alternative of partial differential equations for modelling distributed parameters systems, and investigating analysis and control problems with such an approach.

That is the academic and scientific life of Professor El Jai who adopted new approaches and opened new prospects to his research subject whenever he felt it necessary.

Beyond all this achievements, his co-workers and friends always emphasis the generous personality and great intellectual and human qualities of Abdelhaq El Jai. As a former student, PhD researcher and later as a colleague, I had the opportunity to fully appreciate his availability, his commitment and energy in work, his simplicity, integrity and honesty.

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