

Prelude to Eight Essays on Control Science in the XX-th Century

Automatic control systems have been operating in many machines and devices at different periods of the human civilization. The control of windmills using centrifugal governors, dating back to the 17th century, is an early example. However, the rise and development of Control Science as an independent discipline has taken place in the 20th century only. After some initial decades of specific developments spurred by industrial needs and military requirements, the field has witnessed a paradigm shift about 50 years ago, under the impact of remarkable scientific discoveries. This paradigm shift gave rise to a new and awesome field, rich with theoretical challenges and multidisciplinary applications. At about the same time, an actual “control community” developed its own identity by setting the foundations for international societies like the International Federation of Automatic Control (IFAC), the Institute of Electrical and Electronics Engineers (IEEE), and others, and creating its own scientific journals.

Normally, technical contributions on the frontiers of research are published in the European Journal of Control. However, considering the fading of time, we thought that this Journal would render a great service to our community by recording the views and memories of a number of senior and authoritative scientists of our field about the dawn of systems and control some 50 years ago, and the way our field has developed into a mature discipline.

Our aim was neither to describe the complete picture, nor to write the “official” story of the dawn of control and its evolution. We have instead addressed a selected group of distinguished scientists who have been very active contributors to the field of Control Science through most of these 50 years, and we have asked them to share with our readers their views, their experiences, and their memories. These scientists have been selected based on the role they played in our scientific community, more than on the country where they have worked even if, by a “historical” point of view, these individuals were living and working in particular places and institutions of the world, and they are therefore excellent witnesses of the way the ideas of the time were being received in their local communities.

We have voluntarily refrained from giving the authors of this special issue precise guidelines, leaving them very free to report on their personal experience and their personal views, if they wished to do so. Our hope was that by putting together their personal experiences on the growth of the local community to which they belonged, in its interaction with the rest of the scientific world, a picture would emerge about the way our field has evolved, our community has grown, and specific breakthroughs have come out.

We are extremely grateful to Karl Johan Åström, Roger Brockett, Han-Fu Chen, Daizhan Cheng, André Fossard, Guido Guardabassi, Alexander B. Kurzhanski, David Q Mayne, and Jan C. Willems who have accepted to take on this challenge. As you read this special issue, you will discover that they have put a tremendous amount of effort in writing their story, and that these stories cover a very broad spectrum in terms of style and content. Some authors have performed a remarkable search for archival information, whereas others have taken the risk of conveying very personal and forceful views on the evolution of our subject, and some have discussed the evolution of our field in a fascinating socio-historical perspective. We believe that the range of views and information conveyed in the collection of eight papers in this special issue constitutes a very rich harvest, which will have an enduring value for all researchers in our field, both the young ones who did not witness the “birth of Control Science” and the not so young ones who may have made part of the journey reported upon by our eight authors.

The papers consider several aspects, taking into account the diverse backgrounds of our authors. Thus, some contributions underline the rise of control as spurred by industrial needs, whereas others mainly focus on academic events or on the establishment of scientific societies. In all papers, the enthusiasm for the new ideas and methods that came out in the 1950s and 1960s is acknowledged and witnessed. Moreover, it emerges that control science acted as a basic tool of friendly coexistence among nations, playing a remarkable role especially in those times which were marked by the so-called cold war.

We now let you enter into the world of our eight contributors, and we wish you a pleasant reading.

Guest Editors
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