

Guest Editorial

A Look Into the Past and a Perspective on the Future

IT WAS many years ago, during early 90s that a group in the IEEE Industrial Electronics Society (IES) started an initiative on the establishment of a journal dedicated to mechatronics. It was given that such a journal should have the involvement of mechanical engineers too and therefore some colleagues from the American Society of Mechanical Engineers (ASME) were included in the discussions. The end result was the birth of IEEE/ASME Transactions on Mechatronics, equally owned between IEEE and ASME. The entities involved were IEEE IES, IEEE Robotics and Automation Society (RAS), ASME Dynamic Systems and Control Division (DSCD), and ASME Design Division (DD). The involvement of ASME DD did not last long; the publication soon became an equally shared one between the remaining three entities.

The first issue of the IEEE/ASME TRANSACTIONS ON MECHATRONICS (TMECH) came out in March 1996. The very first article of the issue was an editorial [item 1] in the Appendix] that discussed “What Is It, Why, and How?” of mechatronics. At the end of the year the number of pages published was a bare 294 pages in four issues. The growth since then, especially during the recent years, has, as shown in Fig. 1, been phenomenal, reaching in recent years well more than 3000 pages. The number of issues published yearly had therefore to be increased to six in 2005. TMECH is now one of the leading journals in its area, thanks to the dedicated efforts of its Editorial Board under the leadership of its Editor-in-Chiefs that are listed in Table I.

During the last two decades, profound technological changes have taken place, the main characteristics of the changes being convergence and erosion. We are witnessing a convergence phenomenon, convergence fueling further convergence and finally laying the foundations for the emergence of new technologies. The advances are generally at the edge of traditional disciplines and the connections between different disciplines are becoming the core of the new technologies, in a not multi, not inter but a transdisciplinary manner. At the same time the boundaries between different disciplines (and many other things) are eroding, what mechanical engineering is, what electrical engineering is and what computer engineering is, are becoming difficult to define. In fact what engineering is and what basic sciences are nowadays difficult to define. At the time of the establishment of TMECH, the term mechatronics was defined as

“the synergetic integration of mechanical engineering with electronic and intelligent computer control in the design and manufacture of industrial products and processes.”

With the profound changes in technology, in the form of amalgamation of information, communication and control tech-

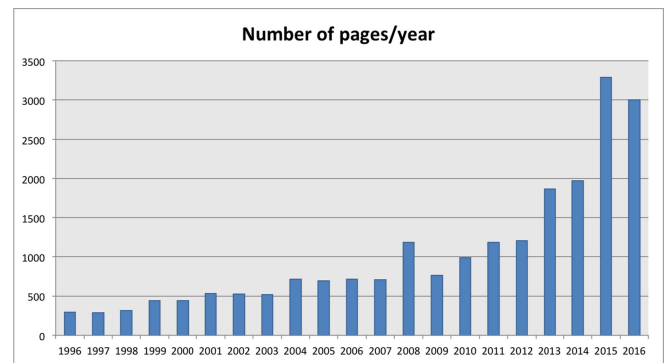


Fig. 1. Number of pages published per year in TMECH.

TABLE I
EDITOR-IN-CHIEFS OVER THE YEARS

Year	EiC	Entity Represented
1996	Fumio HARASHIMA	IEEE IES
1997–1999	Masayoshi TOMIZUKA	ASME DSCD
2000–2002	Toshio FUKUDA	IEEE RAS
2003–2007	Ren C. LUO	IEEE IES
2008–2010	Kok-Meng LEE	ASME DSCD
2011–2013	Kok-Meng LEE	IEEE RAS
2014–2016	Okay KAYNAK	IEEE IES
2017–2019	George CHIU	ASME DSCD

nology driven approaches, a new definition was offered for 21st century [item 2] in the Appendix] as

“the synergetic integration of physical systems with information technology and complex-decision making in the design, manufacture, and operation of industrial products and processes.”

However, with the recent emerging paradigms of big data and cyber physical systems, supported by new disruptive advances both on the software and the hardware sides, a new definition of mechatronics may soon be needed.

Another development that we need to consider is related to the publishing ecosystem. It may be that the present form of peer reviewed, archival articles will soon disappear, authors will have their own blogs to post their research findings, their followers will provide feedbacks, with possible “likes” and what not and the authors will continually update their “postings” accordingly. We therefore need to start discussing how to position TMECH in the face of the disruptive changes to come (to the extent of who the author is, who the publisher is becoming indistinguishable!).

For the last three years, I have been serving as the Editor-in-Chief of TMECH, which has been a very honorable but also onerous duty for me. I would like to express my gratitude to the members of the Editorial Board whose cooperation, dedication, and expertise have helped me to enhance the reputation of TMECH, set by the Editor-in-Chiefs before me. It is now time for me to hand over the flag to George Chiu and I wish him all the best.

Yours sincerely

OKYAY KAYNAK

Department of Electrical and Electronic Engineering
Bogazici University
Istanbul 34342, Turkey
okyay.kaynak@boun.edu.tr

APPENDIX RELATED WORK

- 1) F. Harashima, M. Tomizuka and T. Fukuda, "Mechatronics-“What Is It, Why, and How?” An Editorial," *IEEE/ASME Trans. Mechatronics*, vol. 1, no. 1, pp. 1–4, Mar. 1996.
- 2) M. Tomizuka, "Mechatronics: From the 20th to 21st century," *Control Eng. Practice*, vol. 10, no. 8, pp. 877–886, Aug. 2002.