

# Editorial

**T**WENTY years ago, the field of robotics was galvanized by the creation of a dedicated archival research journal under the auspices of the IEEE Robotics and Automation Society (RAS). We now have the opportunity to do the same for the field of automation. Discussions with leading automation researchers (both within and outside of IEEE) and a detailed analysis of competing journals revealed the need for a major archival journal devoted exclusively to automation. In February 2003, after extensive discussions and inquiry, the IEEE voted to bifurcate the IEEE TRANSACTIONS ON ROBOTICS AND AUTOMATION (T-RA), the top-cited publication on robotics. The renamed IEEE TRANSACTIONS ON ROBOTICS (T-RO) now has a sibling: the IEEE TRANSACTIONS ON AUTOMATION SCIENCE AND ENGINEERING (T-ASE). You are reading the premier issue!

Automation plays an increasingly important role in the global economy and in our daily lives. Engineers strive to combine automated devices with mathematical and organizational tools to create complex systems for a rapidly expanding range of applications. To meet these challenges, T-ASE publishes foundational research on automation: scientific methods for machines and systems operating in structured environments over long periods, and for the explicit structuring of environments. Subjects include the abstractions, algorithms, theories, methodologies, models, systems, and case studies that can be applied across industries to significantly advance efficiency, quality, productivity, and reliability for society.

One of our goals is to dispel the conventional wisdom that automation is limited to only manufacturing, though manufacturing is a primary application of automation. T-ASE defines automation broadly to include new application areas such as biotechnology, pharmaceutical, and health; construction, transportation, and security; manufacturing, maintenance, and supply chains; home, laboratory, and service; business and software; and food handling and processing. Research in automation includes many topics related to robots and intelligent machines/systems, and also includes topics at the operational/enterprise level such as system modeling, analysis, performance evaluation; production planning, scheduling, coordination; risk management; and supply chain management.

To seek a wide readership among industry practitioners interested in integrating knowledge across disciplines, each paper will include a short "Note to Practitioners" to help make the article more broadly accessible. Within the "Note to Practitioners," authors will step back and describe, without jargon, how their results might be applied to practical problems. Inevitably there is a ramp-up stage. Many papers for the first few issues have been transferred from T-RA, and "Notes

to Practitioners" were prepared at the last minute. We will, however, require them for future submissions and include them as part of the paper review process.

More details on T-ASE's history, distinctions between the scope of T-RO and T-ASE, sample application areas, examples of "Note to Practitioners," and updated Table of Contents, Call for Papers, and submission information are available at the T-ASE website: [www.ieee.org/t-ase](http://www.ieee.org/t-ase).

In addition to RAS, two other IEEE Societies are Technical Co-sponsors: Industrial Applications (IAS) and Systems, Man, and Cybernetics (SMC). T-ASE has an Editorial Board and an Advisory Board. The Editorial Board is responsible for the daily operations and management of the TRANSACTIONS. Similar to the Editorial Board of the T-RA and the new T-RO, we have a three-tier system consisting of an Editor-in-Chief, a small number of Editors (currently four), and multiple (currently 29) Associate Editors. Members of the Editorial Board are listed on the cover pages of this issue. Their responsibilities include not only recommending the acceptance or rejection of papers, but also improving paper quality by conducting a constructive, cultivating, and timely review process for high-quality papers. In view of the broad coverage and rapid development of automation science and engineering, T-ASE created an Advisory Board to provide advice, support, long-term vision, and bridges to related societies and publications. Members of the Advisory Board are listed on the cover pages of this issue. The RAS has established a Best T-ASE Paper Award, and each year the winning co-authors will receive certificates and share \$1000. We will also have the Googol Best New Application Paper Award for at least five years under the generous contribution of Googol Technology (HK) Ltd., and the winning co-authors will also receive certificates and share \$1000.

This premier issue includes five regular papers and four short papers. The regular papers cover a web-based rapid prototyping system, energy management networks for building automation, port yard storage optimization, design of six sigma supply chains, and autonomous and agile information coordination systems. The short papers include root-cause determination of multistage manufacturing processes, scheduling of robotic cells for semiconductor equipment manufacturing, a case study of automotive paint shops, and a productivity study of parallel production lines. The next issue will include a **Special Section on Workholding and Fixturing** coordinated by T-RA/T-RO Editor I. Walker with Guest Editors M. Wang, E. DeMeter, S. Melkote, K. Goldberg, and Z. Li. We also have a Call for Papers for a special issue on Nano-scale Automation and Assembly. If you are in doubt about whether your paper fits within our scope, please contact the Editor-in-Chief with your title and abstract. Please submit papers in double columns either in WORD or PDF format to <http://mc.manuscriptcentral.com/t-ase>. Instructions for authors are available on-line at