Editor's Letter

Dear Authors, Readers,

Journal of Mechatronics and Artificial Intelligence in Engineering publishes theoretical and/or experimental work and tutorial expositions of permanent reference value in the general area of mechatronics, including different applications in mechanical and electrical engineering with artificial intelligence.

During recent years, the technology in mechatronics and artificial intelligence have been explored.

When we have called the word "mechatronics", the concepts of robotics, automation, and electromechanics occurs in peoples mind. The word etymologically comes from the union of "mecha-" of mechanics and "-tronics" of electronics, but neither it is the synonym of "electromechanics", nor all robots and/or automation systems are mechatronic. In order to classify a system as mechatronic:

• The system must classifiable as electromechanical, i.e. it must contain mechanical and electronic parts in an organization and/or there must be a conversation of mechanical energy to electrical energy or vice versa. Here, the mechanical energy notion includes all energy forms alike physical, hydraulic, pneumatic, thermal, etc., and electrical energy notion includes all energy forms alike electronic, magnetic, electromagnetic, luminary, etc.

• The system must be "smart".

In the simplest term, a smart system is managed to change its reaction to different states of the system, without under the control of a human.

Today, smart systems with artificial intelligence, i.e. learning and problem solving smart systems, not only belongs to theoretic scientist or industry but also takes parts of our daily lives. Mechatronic systems with artificial intelligence occupy an important place for researchers, scientists, engineers, technologists, technicians, and even recreational tinkers who work/study in related fields.

As the human population of our planet increases, only smart vehicles and smart city architectures can answer crucial requirements of today's people living and working in the metropolitan areas. Especially, smart cars can be called the main goal of artificial intelligence science.

Modeling and optimization become harder when there are both mechanic and electronic parts that exist in a system. When the system has artificial intelligence, i.e. the control system reforms itself in different workplaces, experimental solutions become only choice for today's researchers and computers. Maybe in forthcoming years, models can be calculated by the high-speed computers, but as we see in our smartphones, with every development in hardware, new software problems come into existence even some people think the reasons of the problems are not crucial but they collapse the whole system. These smartphones become useless, even when the user only uses them for only calling and sending texts, despite there is no significant improvements in calling and text communication technologies. The efficient use of the sources is always vital. Thus, advances in digital systems, computing, and new discrete-time control models and algorithms have an important role for advances in the field of artificial intelligence.

Last, one important point is, if a system (mechatronic or not) can be controlled by basic linear methods, artificial intelligence usually (almost always) makes the system less stable and less efficient. Distributed decision structures, using different control methods for different parts of the complex systems is also a notable tactic for the optimization of the sources.

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