

JOURNAL of AUTOMATION, MOBILE ROBOTICS and INTELLIGENT SYSTEMS

A quarterly focusing on new achievements in the following fields:

- Fundamentals of automation and robotics • Applied automatics • Mobile robots control • Distributed systems • Navigation
- Mechatronic systems in robotics • Sensors and actuators • Data transmission • Biomechatronics • Mobile computing

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Marketing office:

Małgorzata Korbecka-Pachuta *mkorbecka@piap.pl*

Secretary:

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Subscription: *sub@jamris.org*

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Editorial Office:

**Industrial Research Institute for Automation
and Measurements PIAP**

Al. Jerozolimskie 202

02-486 Warsaw, POLAND

Tel. +48-22-8740109

office@jamris.org

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Editorial

The launching of a new journal is always a big event for those thanks to whom the idea of the journal has been born and then materialized, and to those who have decided to devote their time and efforts to find a proper formula and actions that would finally lead to the appearance of the first issue. Moreover, the launching of a new journal is a relevant event to the entire scholarly, scientific and research and development community for whom the journal is meant. All these people, and related institutions, are provided with a new medium for the advancement of their fields, communication of new developments, publication of new results, etc. These possibilities are crucial for a proper functioning of those communities, and for the careers and development of their members.

The journal that is herewith making its appearance, ***Journal of Automation, Mobile Robotics and Intelligent Systems***, has been conceived during long discussions in many scholarly, scientific and research and development communities across Poland, Europe and elsewhere. These communities, who have been active in various areas of automatic control, or - more generally - automation, robotics, intelligent sensors, intelligent systems, etc., have come to a conclusion that it does make sense to launch this new journal in spite of the fact that, judging by appearance, there is an abundance of similar journals published around the world. A natural question is what makes this journal so special that those communities, and finally, the editorial board, has decided to launch the journal.

Let us therefore look at the editorial policy of the journal. First, one should mention that the idea to publish the journal, has been materialized thanks to the Industrial Research Institute for Automations and Measurements (PIAP) in Warsaw, Poland who has provided means and multifaceted support, and whose management and staff has done a great job by both joining the editorial board and providing a technical support.

The Industrial Research Institute for Automation and Measurement is a very special research and development center not only at a national level in Poland, but also at the European and world level. Basically, it combines a high level applied research in automation, robotics, sensors, etc. with an unprecedented record of successful implementations of novel solutions exemplified by anti-terrorist mobile robots, comprehensive solutions for process automation, intelligent sensor systems, etc. The Institute has been active for a long time in all kinds of well

known national and international research and development projects, and a high stature and reputation of the Institute has justified its pivotal role in the process of all those discussions and consultations that have finally led to the launching of the journal.

Now, let us think why the title, scope and areas covered by the journal should make it attractive to a wide community. First, automation is of utmost importance in all kinds of human activities. Traditionally, automation was meant in a narrow sense as pertaining to industrial processes that had to be controlled, either by a human being or, preferably, by inanimate, automatic tools and techniques. There has been much success in these areas, ranging from a successful control of industrial processes bringing about better products at lower prices, with safer processes, to space and military applications that have made it possible for spacecraft or missiles to hit their intended targets, exemplified by the Moon or the enemy's tanks, with an unprecedented precision, and without a risky human presence which is impossible in, e.g., the space or battlefields.

However, automation is by no means restricted to the control processes mentioned above. There is an urgent need for automation in virtually all kind of human activities in which it is impossible, too dangerous, too costly, not precise enough, etc. to exert actions "manually" because this may be beyond human cognitive or mental abilities, human dexterity, human speed of reaction and action, etc. There can also be simply not enough qualified personnel to do the job which may play more and more decisive a role in the future in view of the aging of societies in virtually all developed countries. Automation is therefore needed in all kind of office works, services, home activities, etc. In short, automation is a general need in virtually all areas of human activities.

Closely related to automation is robotics which is meant as the science and technology of **robots**, some agents - mostly electro-mechanical devices but also software agents that can perform some tasks in time and space. These tasks may involve human-like dexterity, movements, carrying, etc. This all involves, first, perception, i.e. obtaining information about the environment via sensors. Then, there is processing that leads to the determination of an appropriate course of action by using various tools from, for instance, pattern recognition, control theory, etc. In many modern approaches sophisticated tools and techniques from broadly perceived

artificial intelligence, and - more generally - intelligent systems are more and more often employed. Finally, actions must be implemented.

Needless to say that **mobile robots** play in this context a particular role. They have the capability to move around in their environment and are not fixed to just one physical location. Mobile robots are clearly not confined to industrial application but play a considerable role in military and space applications, or entertainment and home applications. It comes at no surprise that these particular and versatile capabilities and areas of applications of mobile robots have made them a subject of intensive research and development in the academia and industry alike.

One can see that if we look at what is occurring at present, and what is considered to be really needed and useful in broadly perceived fields of automation and robotics, notably mobile robots, is a necessity to use more and more advanced tools and techniques which would make it possible to somehow devise and implement more "intelligent", often more human consistent, forms of perception and understanding of the environment, the user's intentions and goals, and then device appropriate actions to be taken. This is why **intelligent systems** come to play as a vast array of means and paradigms that attempt to close the gap between the "intelligent" human being, who can well manage even in the most adverse and unknown environments (on the Moon, in the space, etc.), and a "stupid" machine that is unable to do anything that has not previously been explicitly programmed. That is why **intelligent systems** constitute a vital part of the areas of automation and robotics, and have therefore been explicitly mentioned in the title of this new journal.

If we take into account the perspective outlined above, we can see what makes this journal so special and unique. Its mission is to present and advocate all kinds of modern and promising approaches, tools and techniques which will concern those modern directions in broadly perceived automation and robotics, notably mobile.

The journal will publish both survey, state of the art and position papers by leading experts in their areas, and original technical contributions. Though preference will be given to, and emphasis will be on more constructive and applied works, high level theoretical and foundational papers will also be published. Moreover, as a special service to the community we will be promoting valuable research results by the young generation of researchers who can often view problems from fresh and new perspectives, and whose results obtained under the guidance of their more experienced supervisors are often mature and at a high level of originality. This new generation will shape the future of our fields and we believe that it is extremely important to provide them with a possibility to publish their results and get involved in a constructive scientific discussion with their colleagues and peers.

We hope that all our ambitious plans will be fulfilled, and the journal will be useful to a wide research community who will find it to be a proper medium in which it will be worthwhile to present their results, exchange new ideas, discuss issues of interest, and learn of new trends and directions.

Academician **Janusz Kacprzyk**
Professor, Ph.D., D.Sc.
Fellow of IEEE, IFSA
Editor-in-Chief

Editorial

I have the honour and pleasure to write this letter to the first issue of the new quarterly ***Journal of Automation, Mobile Robotics and Intelligent Systems***.

I am particularly glad that in Editorial Board and Staff has successfully fulfilled our long-time intension and dream to take advantage of a rare combination of theore-tical research, technology and implementation that has been characteristic for the activities of the Industrial Research Institute of Automation and Measurements since its foundation.

It has been over 42 years since the Industrial Research Institute for Automation and Measurements (PIAP) was established. PIAP is public research institute which belongs to the top ten of the Polish Research Institutes. We have always been actively involved in pursuing most ambitious challenges in automation, robotics and sensors. Recently we have concentrated on mobile automation, robotics, intelligent measurement and sensor systems. For a long time it has became obvious to us that to develop all those modern technology and systems we need to resort to new tools, techniques and paradigms, notably those stemming from the widely the perceived field of intelligent systems. This all has implied the focus of the ***Journal of Automation, Mobile Robotics and Intelligent Systems*** which is concentrated on our main areas of interest, that is automation and mobile robotics, with emphasis on the use of modern tools and techniques that are attributed to intelligent systems.

As Director of the Institute I am sure that the launching of the ***Journal of Automation, Mobile Robotics and Intelligent Systems*** will be met with interest in the research and professional communities, and efforts of devoted and enthusiastic Editorial Board and Staff will lead JAMRIS to success.

Sincerely,

Jan Jabłkowski, PhD Eng.
Director
Industrial Research Institute
for Automation & Measurements

