
ABSTRACTS

MACHINES FOR INSPECTION OF PIPES

(pages 1-7)

Tatiana Kelemenová

Technical University of Kosice, Faculty of Mechanical Engineering, Letna 9, Kosice, Slovak Republic,
tatiana.kelemenova@tuke.sk

Peter Frankovský

Technical University of Kosice, Faculty of Mechanical Engineering, Letna 9, Kosice, Slovak Republic,
peter.frankovsky@tuke.sk

Ivan Virgala

Technical University of Kosice, Faculty of Mechanical Engineering, Letna 9, Kosice, Slovak Republic,
ivan.virgala@tuke.sk

Ľubica Miková

Technical University of Kosice, Faculty of Mechanical Engineering, Letna 9, Kosice, Slovak Republic,
lubica.mikova@tuke.sk

Michal Kelemen

Technical University of Kosice, Faculty of Mechanical Engineering, Letna 9, Kosice, Slovak Republic,
michal.kelemen@tuke.sk

Keywords: mechatronics, machine, locomotion, pipes, wheeled

Abstract: Machines for inspection of pipes are locomoted inside pipe via used various types of locomotion. This article deals with wheeled in-pipe locomotion. Developed in-pipe machines are described. Pipe is as constrained space and it is complicated to design the machine for this purpose. Problems that are necessary to solve can be divided into several groups, small dimension and scalling effect of actuators, power supply and cables, impurities inside pipes etc.

DIAGNOSTICS OF MECHATRONIC SYSTEMS

(pages 9-12)

Yury Rafailovich Nikitin

Kalashnikov Izhevsk State Technical University, Department of Mechatronic Systems, Studencheskaya 7, 426069,
Izhevsk, Russia, nikitin@istu.ru

Ivan Vasilevich Abramov

Kalashnikov Izhevsk State Technical University, Department of Mechatronic Systems, Studencheskaya 7, 426069,
Izhevsk, Russia, abramov@istu.ru

Yury Vasilevich Turygin

Kalashnikov Izhevsk State Technical University, Department of Mechatronic Systems, Studencheskaya 7, 426069,
Izhevsk, Russia, turygin@istu.ru

Andrej Ivanovich Abramov

Kalashnikov Izhevsk State Technical University, Department of Mechatronic Systems, Studencheskaya 7, 426069,
Izhevsk, Russia, hitech1015@yandex.ru

Keywords: diagnostics, mechatronic systems, model, fuzzy logic, neural networks

Abstract: The features of diagnostics of mechatronic systems are reviewed. A logical-linguistic model of diagnosis and prediction of residual life of mechatronic systems has been developed. The proposed model is a complex consisting of a description of the initial linguistic variables diagnostic parameters and technical conditions, the laws of the physical processes of degradation in mechanical, electrical, electromechanical, electronic devices, changes in patterns of diagnostic parameters in the event of defects in view of the functioning and modes of mechatronic systems. Identified patterns are presented in the rule base of fuzzy inference to determine the technical condition and calculation of residual life and intervals of diagnosing MS. Experimental studies have confirmed the adequacy of the logical-linguistic model of

mechatronic systems. A direction of further research will be improvement of the model accuracy for chosen mechatronic object.

MEASURING THE CHARACTERISTICS OF VOLTAGE SOURCE – REMOTE PHYSICAL EXPERIMENT CONTROLLED VIA INTERNET

(pages 13-17)

Karol Kvetan

Slovak University of Technology, Faculty of Materials Science and Technology, Institute of Materials Science,
J. Bottu 25, 917 24 Trnava, Slovak Republic, karol.kvetan.@stuba.sk

Helena Hološová

Slovak University of Technology, Faculty of Materials Science and Technology, Institute of Materials Science,
J. Bottu 25, 917 24 Trnava, Slovak Republic, helena.holosova.@stuba.sk

Zuzana Červeňanská

Slovak University of Technology, Faculty of Materials Science and Technology, Institute of Applied Informatics,
Automation and Mechatronics, J. Bottu 25, 917 24 Trnava, Slovak Republic, zuzana.cervenanska.@stuba.sk

Keywords: remote controlled experiment with ISES kit, internal resistance, electrical DC-source, pedagogical research
Abstract: The article describes the incorporation of pilot experiment of remotely controlled laboratory task into physical education at the Faculty of Materials Science and Technology. It deals with the measurements of the basic characteristics of electrical voltage source. The individual parts of arrangement were realized by the ISES-kit that is capable to command the measuring procedures and to transform the corresponding values via computer. We present an evaluation of the test, completed by students included to the process. It has been realized in the mentioned laboratory experiment by two different methods – via classical measurement and via internet. Relevant results have been evaluated by Kolmogorov's-Smirnov's statistical method.

NAVIGATION OF THE AUTONOMOUS GROUND VEHICLE UTILIZING LOW-COST INERTIAL NAVIGATION

(pages 19-23)

Rastislav Pirník

Department of Control and Information Systems, Faculty of Electrical Engineering, University of Žilina, 010 26 Žilina,
Slovak Republic, rastislav.pirnik@fel.uniza.sk

Marián Hruboš

Department of Control and Information Systems, Faculty of Electrical Engineering, University of Žilina, 010 26 Žilina,
Slovak Republic, marian.hrubos@fel.uniza.sk

Dušan Nemeč

Department of Control and Information Systems, Faculty of Electrical Engineering, University of Žilina, 010 26 Žilina,
Slovak Republic, dusan.nemec@fel.uniza.sk

Pavol Božek

Department of Control and Information Systems, Institute of Applied Informatics, Automation and Mechatronics,
Faculty of Materials Science and Technology, Slovak University of Technology, 917 24 Trnava, Slovak Republic,
pavol.bozek@stuba.sk

Keywords: inertial navigation, automated vehicle, sensors, sensor fusion
Abstract: This article discusses usage of the inertial navigation combined with one or multiple odometers for precise navigation of the autonomous ground vehicle. Such navigation does not require any kind of external signal; therefore it is resistant against external disturbance and might be used in harsh industrial environment. Using low-cost MEMS gyroscope and accelerometer provide only attitude and heading reference; the odometers are responsible for measurement of the dislocation and the vehicle's speed.

RESEARCH AND DEVELOPMENT OF A NEW SYSTEM OF THE AUTONOMOUS CONTROL OF ROBOT TRAJECTORY

(pages 25-28)

Lukáš Chynoradský

Institute of Applied Informatics, Automation and Mechatronics, Faculty of Materials Science and Technology in
Trnava, Slovak University of Technology, J. Bottu 25, Trnava, Slovak Republic, lchyno@gmail.com

Pavol Božek

Institute of Applied Informatics, Automation and Mechatronics, Faculty of Materials Science and Technology in
Trnava, Slovak University of Technology, J. Bottu 25, Trnava, Slovak Republic, pavol.bozek@stuba.sk

Keywords: inertial sensor, robot, gyroscope, accelerometer

Abstract: The article deals with one of the options respectively control of the trajectory of movement of a laboratory robot with three degrees of freedom in a predefined area. To do this we used data obtained from inertial sensors, a gyroscope and accelerometer. The inertial navigation is self-supporting navigation technique utilizing for measuring accelerometers and gyroscopes. By them it is possible to watch a position and orientation of an object relative to a known starting point. A basic element of each inertial navigation system (INS) is inertial measure unit, that consists usually of three gyroscopes for angle speed measurement and three accelerometers for linear speeding-up measurement.
