



ÓBUDAI EGYETEM
BÁNKI DONÁT GÉPÉSZ ÉS BIZTONSÁGTECHNIKAI MÉRNÖKI
KAR

Program

2011. november 15.

10:00 **Plenáris ülés / Plenary session**
Galamb József terem (I. 115.)
Elnök: Réger Mihály

13:00-14:00 ebédszünet

14:00
Méréstechnika és minőségbiztosítás szekció (I. 115.)
Elnök: Galla Jánosné
Mechatronikai szekció (fsz. 45.)
Elnök: Bencsik Attila

2011. november 16.

9:00
Anyag- és gyártástechnológia szekció (I. 115.)
Elnök: Réger Mihály
Gépészeti szekció (fsz. 45.)
Elnök: Horváth Sándor
Ergonómia, munkavédelmi szekció (I. 145.)
Elnök: Szabó Gyula

13:00-14:00 ebédszünet

14:00
Biztonságtechnikai szekció (I. 115.)
Elnök: Kovács Tibor

PLENARY SESSION

PLENÁRIS ÜLÉS

Chairman - Szekcióelnök: Mihály Réger

Mészáros György elnök,
Nemzeti Innovációs Hivatal/ National Innovation Office
Hazai innovációs feladatok

Antal Bejczy
CALTECH/ Pasadena, California
A robotic stepper device concept for locomotion rehabilitation

Ján Dusza
Institute of materials research of SAS, Košice, Slovakia
Microstructure and properties of ceramic nanocomposites

Arnold Ószi Óbudai Egyetem/Óbuda University
Leung Yuen Ting Hong Kong University
Tibor Kovács Óbudai Egyetem /Óbuda University
Dependence on technical parameters of the conditions of application of
biometrical identification devices

Rajnai Zoltán Óbudai Egyetem/Óbuda University
Új távközlési technológia alkalmazhatósági tesztsorozatának tapasztalatai

Antal K Bejczy

Senior Research Scientist

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A ROBOTIC STEPPER DEVICE CONCEPT FOR LOCOMOTION REHABILITATION

A novel strategy for rehabilitation of locomotion impaired subjects uses aBody Weight Support Technique (BWST) on a treadmill which involves three to four therapists to carry out the required patient training exercises on the treadmill. This paper briefly describes (I) the essence of the novel rehabilitation strategy quoting medical justification, (II) the technical approach to the design and development of a robotic device aimed to reduce the manual involvement of at least two therapists in the locomotion training exercises on a treadmill, and (III) the main conceptual design features of a possible robotic device.

Ján Dusza

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MICROSTRUCTURE AND PROPERTIES OF CERAMIC NANOCOMPOSITES

The contribution is focused on the development of high-tech ceramic composites for safe and durable application in different fields of industry. In-situ reinforced Si_3N_4 -SiC micro/nanocomposites, carbon nanofibers reinforced zirconia ceramics and graphene platelets reinforced Si_3N_4 have been developed and investigated. In hot pressed Si_3N_4 -SiC systems the influence of the rare-earth oxide additives (La_2O_3 , Nd_2O_3 , Y_2O_3 , Yb_2O_3 and Lu_2O_3) and the addition of SiC nanoparticles on the microstructure, mechanical properties and failure and damage mechanisms have been studied. In hot pressed and spark plasma sintered zirconia/carbon nanofiber composites, prepared by addition of 2.0 and 3.3 vol. % carbon nanofibers (CNFs) the effect of the sintering route and the carbon nanofiber additions on the microstructure and fracture/mechanical properties was investigated. As regards the Si_3N_4 + graphene platelets composites microstructure characteristics and fracture toughness were investigated. In all cases the properties of composites have been compared to that of the monolithic material. Micro and macro-fractography was applied for the study of fracture and damage mechanisms.

In Si_3N_4 + SiC composites the additives with smaller size of rare-earth cations influenced positively the fracture toughness and wear characteristics. In ZrO_2 -CNF the addition of a low amount of CNFs into ZrO_2 significantly increased the electrical conductivity and decreased the friction due to the lubrication effect by carbon phases. In Si_3N_4 + graphene platelets composites the addition of 1 wt% of platelets significantly increased the fracture toughness.

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DEPENDENCE ON TECHNICAL PARAMETERS OF THE CONDITIONS OF APPLICATION OF BIOMETRICAL IDENTIFICATION DEVICES

The specifications indicated by the manufacturers in data sheet may be different in practice depending on the environment. The reasons are diverse. The most remarkable conditions (temperature, air humidity and their stability where the device is installed) are fundamental in the aspect of operation. It is very frequent, that users' physical properties (injured or dirty finger, squinting) make them inadequate for successful biometrical identification. If an instrument operates near its maximum capacity, the parameters will be disastrously degraded on a number of occasions. In our presentation we analyze the operation of four types of biometrical identification devices (fingerprint, hand geometry, palm vein and iris), we highlight the problems encountered and we also offer resolutions. We plan to publish our tests on the Web-side of our university - facilitating the users' choice this way.

QUALITY SYSTEMS, QUALITY TECHNOLOGY SECTION

MÉRÉSTECHNIKA ÉS MINŐSÉGBIZTOSÍTÁS SZEKCIÓ

Chairmanwomen - Szekcióelnök: Jánosné Galla

1. Mohai Tamás

WERTH Magyarország Kft.

The importance of defining uncertainty in measuring regarding the analogy valuation in scope of the excessive requirements of the German automotive industry

2. József Lakatos

Kischemicals LLC - Kischemicals Kft.

Integrated Management System in the Chemical Industry

3. Kőszegi József

Hungarian Trade Licensing Office Metrology Authority

Magyar Kereskedelmi Engedélyezési Hivatal Metrológiai Hatóság

Metrológia és minőség

4. Lajos Kovács

EGIS PLC IT Customer Focus Unit Manager

EGIS Nyrt. Kutatási informatikai egység

Software Development and Validation in the Pharmaceutical Industry

5. Mihály Farkas

Grundfos Manufacturing Hungary Ltd.

Grundfos Hungária Kft.

Lean management in practice

6. Ágota Drégelyi-Kiss, Georgina Nóra Tóth

Óbuda University, Bánki Donát Faculty of Mechanical and Safety Engineering

Óbudai Egyetem Bánki Donát Gépész és Biztonságtechnikai Mérnöki Kar

Role of applied statistics in the teaching of quality

7. Anita Magdolna Szabó, Lóránt Fodor

Budapest University of Technology and Economics

Budapesti Műszaki és Gazdaságtudományi Egyetem

User-friendly package design

Tamás Mohai

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THE IMPORTANCE OF DEFINING UNCERTAINTY IN MEASURING REGARDING THE ANALOGY VALUATION IN SCOPE OF THE EXCESSIVE REQUIREMENTS OF THE GERMAN AUTOMOTIVE INDUSTRY

The significance of calculating uncertainty in measuring keeps growing in recent years. The culture of measurement technology requires standardized notions. The definition of measuring uncertainty is crucial in the field of calibration in laboratories. The calibration certification issued by the given laboratory is an input document of the quality management system of the organization, a data source for the measuring instrument supervisory that is to be processed. Qualifying measuring instruments is a basic requirement of an organization.

The excessive requirements defining uncertainty in measuring and certifications of the aptness of measuring process are stated in the VDA 5.2. issue.

József Lakatos

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INTEGRATED MANAGEMENT SYSTEM IN THE CHEMICAL INDUSTRY

Compliance with the Parties concerned - clients, employees, population, neighbourhood - in the chemical industry means a very serious task and even a great challenge for the participating companies. The Integrated Management System of KISCHEMICALS LLC includes the Quality Management System, the Environmental Management System and the Safety Management System.

The Integrated Management System (IMS) at KISCHEMICALS LLC has been introduced in 2010 September. The successful certifying audit of the IMS had also been carried out at the Company even in the end of 2010. The IMS of the Company was certified by the SGS Hungária Ltd., according to the requirements of MSZ EN ISO 14001:2005 and MSZ EN ISO 9001:2009 norms.

Our Company also operates the MSZ 28001:2008 Safety Management System, its certification is planned to be realized in the near future.

In my presentation I will introduce certain operation areas of KISCHEMICALS LLC, which are in harmony with the relevant standards and legal regulations.

József Kőszegi

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METROLOGY AND QUALITY

It is well known that in quality management - in a sense of metrology - we cannot consider the fulfillment of product requirements without the practical and conscious selection of the measuring tools. The Metrology Act - beside other benefits- facilitates and secures the standardization and precision of measurement facts both inland and abroad with the help of the measurement tools of quality management. The organization that certificated by ISO 9001:2008 have to plan and introduce those observation, analization and development processes that proves the compliance to the requirements.

The question is in which field does the metrology fills a part in the process of achieving the goals and complying to the underlying principles of quality assurance? How can the quality assurance help to carry the metrology-related requirement's point?

The tasks of metrology in Hungary are: state-issued metrology functions, measurement body functions, the controlling and supervising of regional administration bodies and measurement service.

Lajos Kovács

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SOFTWARE DEVELOPMENT AND VALIDATION IN THE PHARMACEUTICAL INDUSTRY

The presentation covers an overview regarding the software development and validation in the pharmaceutical industry, on the basis of its history, standards, guidelines and the validation related activities. Important part of the presentation will be, the software development process streamlining approach of lifecycle, software design, development, validation processes mapping to the documentation.

Mihály Farkas

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LEAN MANAGEMENT IN PRACTICE

The principle of lean philosophy is the ability to accept the necessity of change. It can only be achieved if the commitment of the management and colleague cooperation both meets. This approach is the key of the well functioning organization works without deficit. The slenderized production's basic goal is to produce a better good or service with much more financial efficiency and safety due to minimizing the loss and continuous improvement, and simultaneously improving the organization's own supply chain.

The presentation demonstrates the five principles of lean management in practice – value stream mapping from the customers' point of view, flow, pull, perfection and constant improvement.

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ROLE OF APPLIED STATISTICS IN THE TEACHING OF QUALITY

There have been going on a 4-semester long quality engineer/specialist postgraduate course at Óbuda University Bánki Donát Faculty of Mechanical and Safety Engineering for 15 years. During the education there is strong emphasis on the use of the quality tools, techniques as well as applied statistical tools in practice.

The conformance of the quality of a product or a service is one of the most important goals of the firm. Data collection, evaluation of data and improvement, development of various processes are important tools in order to reach this aim. Decision-making based upon facts and data is essential in the course of actuation of quality management systems. These decisions could be made by means of applied statistical methods.

Higher-level statistical knowledge is important and necessary in the following fields of quality assurance: acceptance sampling, statistical process control, analysis of measurement systems and design of experiments. Accordingly the acquirement of statistical tools is so important to our postgraduate students in order to be able to use these widely spread methods in practice during their work.

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USER-FRIENDLY PACKAGE DESIGN

International research proves that during development of optimally designed consumer products - in addition to maximum product protection - there is growing attention to meet the ergonomic requirements as well. Already in the early phase of development, special needs of the user groups are integrated in the design such as ease of use (opening and closing), clear distinction and general usage.

There are several regulations concerning consumer packaging beyond goods protection extending to environmental and consumer protection.

User-friendly packaging has to meet the high quality, reliability, comfort and ecological requirements. During the design process this goal is achieved by the appropriate material selection, form-giving, ergonomics, graphic design, logistics, marketing and the efficient use of energy.

MECHATRONICS, ROBOTICS SECTION

MECHATRONIKAI SEKCIÓ

Chairman - Elnök: Bencsik Attila

1. Annamária R. Várkonyi-Kóczy

Óbuda University, Bánki Donát Faculty of Mechanical and Safety Engineering
Óbudai Egyetem Bánki Donát Gépész és Biztonságtechnikai Mérnöki Kar
Intelligent Space Applications in Research and Education of Mechatronics

2. Bence Kovács¹, Géza Szayer¹, Ferenc Tajti¹ Solvang Bjorn² and Péter Korondi¹

¹Budapest University of Technology and Economics, Hungary
Budapesti Műszaki és Gazdaságtudományi Egyetem
²Narvik University College, Norway
Design of a universal robot controller

3. Károly Széll¹, Hideki Hashimoto² and Péter Korondi¹

¹Budapest University of Technology and Economics, Hungary
Budapesti Műszaki és Gazdaságtudományi Egyetem
²Chuo University, Japan
Sliding mode control of a telemanipulation system

4. Antal Martinecz¹, Róbert Rácz¹, Mihoko Niitsuma² and Péter Korondi¹

¹Budapest University of Technology and Economics, Hungary
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Control of Mogi Robi

5. Ingrid Langer

Óbuda University, Bánki Donát Faculty of Mechanical and Safety Engineering
Óbudai Egyetem Bánki Donát Gépész és Biztonságtechnikai Mérnöki Kar
Improvement of the colour vision by modifying the spectral distribution of the illumination

6. Edit Tóth-Laufer, Márta Takács, Szabolcs Menthy

Óbuda University, Bánki Donát Faculty of Mechanical and Safety Engineering
Óbudai Egyetem Bánki Donát Gépész és Biztonságtechnikai Mérnöki Kar
Comparative Analysis of Fuzzy Logic-based Risk Evaluation Models

7. István Nagy

Óbuda University, Bánki Donát Faculty of Mechanical and Safety Engineering
Óbudai Egyetem Bánki Donát Gépész és Biztonságtechnikai Mérnöki Kar
MobiRobi in Service of Education

8. Béla Takarics¹, Péter Baranyi², Péter Korondi²

¹ Computer and Automattion Research Institute

²Budapest University of Technology and Economics

Budapesti Műszaki és Gazdaságtudományi Egyetem

Output Feedback Control Based Friction Compensation of a 2 DoF Aeroelastic Wing
Section – A TP Model Transformation Based Approach

9. Nádasi Péter

Szent István University

Szent István Egyetem

Repülőgépes helymeghatározás

10. György Suszter

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Sensors in the practice of industry - Distance measurement by PMD technology

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INTELLIGENT SPACE APPLICATIONS IN RESEARCH AND EDUCATION OF MECHATRONICS

Any well defined environment can be extended to an Intelligent Space (iSpace) if it becomes able (1) to collect information through ambient sensors, cameras, agents, traditional and special interfaces; (2) to process the knowledge at local level; (3) to take actions at local level and/or in cooperation with other units; (4) to send an alert to a higher level surveillance system. The iSpace can, thus, offer a frame for different intelligent applications implemented on the computer system of the space. This presentation gives an overview about recent research and educational initiations and possibilities offered by the iSpace laboratory built at the Institute of Mechatronics and Vehicle Engineering, Óbuda University. The new Lab may contribute to the scientific career of the academic staff as well as to the variegation and improvement of the magnetism of the educational programs of the faculty.

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DESIGN OF A UNIVERSAL ROBOT CONTROLLER

The paper deals with a general purpose industrial robot controller. Due to the modules of the system is universal. It can be connected to several types of robots, even to CNC, turning-mill or other machines. It was connected to an Adept Scara robot successfully, experimental results will be presented.

The basic element of the system is the EMC2 open source robot controller program, which runs in a realtime linux kernel. A PCI card creates the high speed connection between the EMC2 and the machine. DC servo amplifier, digital input and output module, teach pendant, and power electronics designed for the system.

The system is RT-middleware (Robotics Technology Middleware) compatible. The RT-middleware is a common robot control platform, which can easily connect different robots to the same network for a common work.

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SLIDING MODE CONTROL OF A TELEMANIPULATION SYSTEM

This paper presents a 6 DOF tele-micromanipulation system, which enables the human operators to operate micro tasks, such as assembly or manufacturing in the micrometer word with force feedback. The paper focuses on the haptic interface with force feedback. The master and slave devices are connected via internet. The mechanism applied as a human interface device has a reasonable immanent friction. This friction must be compensated in a way that the operator cannot feel this friction force but only the feed backed force from the manipulated environment. The main contribution of this paper is the comparison of the experimental results of a model reference adaptive and a direct model based chattering free sliding mode friction compensator for a human interface device.

Ingrid Langer

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IMPROVEMENT OF THE COLOUR VISION BY MODIFYING THE SPECTRAL DISTRIBUTION OF THE ILLUMINATION

At the Department of Mechatronics, Optics and Engineering Informatics of BME the researches lead by Dr. György Abraham and Dr. Klára Wenzel has shown that defective color vision can be improved by specific spectral transmission color filters which modify the spectral characteristics of the lights reflected by different color surfaces so that the difference is increased between the colors. These color filters placed in front of the eye can be used as glasses. Similar effect can be achieved in artificial lighting conditions if we modify the spectral distribution not the light reflected from the surfaces but the light emitted by light sources. This solution can be used for example as a workspace illumination when carrying out tasks that require good color vision, or as a whole room illumination, which ensures more colorful environment for defective color vision persons.

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CONTROL OF MOGI ROBI

Recently “social robots” have appeared which have been designed to interact with humans and - hopefully - they will be able to interact with other species too in the near future. They were created because of our need for companionship (companions like dogs or cats) so that they could be kept as pets one day.

„Mogi Robi” is one of these robots. To be more exact it is an eto-robot as it's behaviour is based on ethological models with developed by ethologists. This is an extraordinary robot as it's interaction with us is the human-animal type opposed to the usual human-human interaction. The advantage of this is that it allows a much more natural interaction without falling into the uncanny valley. The uncanny valley is Masaro Mori's hypothesis which holds that the more a robot acts or looks like a human being the more repulsive it becomes (because while it resembles us, it is still only a machine with imperfections). We prefer robots that are less human-like.

Though the electronics and control of the robot, and the program of its behavioural model - in other words, the artificial intelligence - are already done, the two still have to be linked together.

Mogi-robi was created to operate in an intelligent space. This means, that its sensors - or part of its sensors - are placed in a confined field (e.g. a room) and not on the robot itself. This concept makes it perfect for indoor use, where it can move with more confidence. Currently the robot fully depends on the intelligent space, it cannot navigate without the help of it.

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COMPARATIVE ANALYSIS OF FUZZY LOGIC-BASED RISK EVALUATION MODELS

In risk management systems the risk factors are described both in qualitative and quantitative terms, therefore models have to be developed that can handle both input types. Since these systems are full of uncertainty and qualitative description the system parameters can be represented in linguistic form, using soft computing - for example fuzzy-based - methods. These techniques are suitable for representing the system outputs with more realistic and user-friendly result. The models analysed in the paper define the risk level of physical exercise-based fuzzy approximate reasoning systems and structural risk management models. Clustering of risk factors and using hierarchical decision structure in these models makes the evaluation simplified and easy expandable. The models were analysed in Matlab environment, using input data selected from the typical experimental measured parameters of several patients. Based on this test the novel theoretical model is suitable for comparison with previously implemented models developed with algorithms by others in order to validate our model. The long-term goal is the real-time risk assessment for the model in question while finding the appropriate sensors and its systematisation is in progress.

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MOBIROBI IN SERVICE OF EDUCATION

At the Óbuda University, Donát Bánki Faculty of Mechanical and Safety Engineering, Institute of Mechatronics and Vehicle Engineering has been established a Mobile Robot science project. The aim of this sub-project is, that in frames of the main, Intelligent Room, Intelligent Robot project to develop a mobile robot (MobiRobi), what should be able to use for scientific, educational, and for researching targets, too. In the final conception the MobiRobi should be able for sound analysing and oral control and to recognise different subjects based on its colour or shape. This presentation will be demonstrate the structure, the control system and functional algorithms of this mobile robot.

Acknowledgments: This sub-project has been sponsored by the Team Research Grant of The Óbuda University.

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OUTPUT FEEDBACK CONTROL BASED FRICTION COMPENSATION OF A 2 DOF AEROELASTIC WING SECTION - A TP MODEL TRANSFORMATION BASED APPROACH

Various approaches to control aeroelastic wing section with structural nonlinearity emerged in the last years. One of the approaches is based on the Tensor Product (TP) model transformation and the feasibility test of linear matrix inequalities (LMIs) under the Parallel Distributed Compensation framework. TP model transformation is a recently proposed technique for transforming given Linear Parameter-Varying (LPV) state-space models into polytopic model form, namely, to parameter-varying convex combination of Linear Time Invariant (LTI) systems. The main advantage of the TP model transformation is that it is executable in a straightforward way and the Linear Matrix Inequality (LMI) based control design frameworks can immediately be applied to the resulting polytopic models to yield controllers with tractable and guaranteed performance. The main contribution of this paper is that it extends the previously established qLPV model of the aeroelastic wing with nonlinear friction in TP model form and an observer based output feedback multi-objective controller is designed. The results of the controller is compared with previous results by simulation.

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SENSORS IN THE PRACTICE OF INDUSTRY - DISTANCE MEASUREMENT BY PMD TECHNOLOGY

General overview of industrial sensors. Main fields of sensor usage in technologies Distance measurement, when not just the precise value is the scope. PMD technology in the industry and in the automotive technology.

**MATERIALS SCIENCE AND MACHINING TECHNOLOGY
SECTION
ANYAG- ÉS GYÁRTÁSTECHNOLÓGIA SZEKCIÓ**

Chairman - Elnök: Réger Mihály

1. Biró Szabolcs - Horváth Richárd - Bogdan Słodki

Óbuda University, Bánki Donát Faculty of Mechanical and Safety Engineering
Óbudai Egyetem Bánki Donát Gépész és Biztonságtechnikai Mérnöki Kar
Esztergalapkák forgácstörési képességének korszerű vizsgálata

2. Árpád Czifra, Gabriella Farkas

Óbuda University, Bánki Donát Faculty of Mechanical and Safety Engineering
Óbudai Egyetem Bánki Donát Gépész és Biztonságtechnikai Mérnöki Kar
Effect of surface roughness for tribological behaviour of engineering polymers

3. Ondrej kovič, K., Buček, P., Pyszko, R., Hulkó, G.

Modeling and Control of Continuous Casting Processes of Steel Based on Virtual Software Environments as Distributed Parameter Systems

4. Tállai Péter - Csuka Sándor

Óbuda University, Bánki Donát Faculty of Mechanical and Safety Engineering
Óbudai Egyetem Bánki Donát Gépész és Biztonságtechnikai Mérnöki Kar
Korszerű PVD-bevonatrendszerek alkalmazása környezetbarát menetformázáskor

5. Miko, B.¹, Beno, J.,² Mankova I.²

¹ Óbuda University, Bánki Donát Faculty of Mechanical and Safety Engineering
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² Technical University of Kosice Country Slovakia

Experimental Verification of Cups-Hights when 3D Milling of Surface with Defined Roundness

6. Mankova I.,¹ Vrabel M.,¹ Beno J.,¹ Miko B.²

¹ Technical University of Kosice Country Slovakia

² Óbuda University, Bánki Donát Faculty of Mechanical and Safety Engineering

Óbudai Egyetem Bánki Donát Gépész és Biztonságtechnikai Mérnöki Kar

Application of Taguchi Method for Coated HSS Drill Performance

7. Varga Péter¹ - Szabó Péter János²

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² Budapest University of Technology and Economics
Budapesti Műszaki és Gazdaságtudományi Egyetem
Többlépéses képlékenyalakítási-hőkezelési stratégiák során kialakuló mikroszerkezet jellemzése

8. Barányi István^{1,2}, Czifra Árpád¹, Kalácska Gábor², Szakál Zoltán², Palásti Kovács Béla¹

¹ Óbuda University, Bánki Donát Faculty of Mechanical and Safety Engineering
Óbudai Egyetem Bánki Donát Gépész és Biztonságtechnikai Mérnöki Kar

² Szent István University - Szent István Egyetem
Scratches detection of worn surface with the help of the profile material ratio (Rmr) roughness parameter special extension to three dimensions

9. Tünde Kovács-Coskun¹, Péter Pinke^{1,2}

¹ Óbuda University, Bánki Donát Faculty of Mechanical and Safety Engineering
Óbudai Egyetem Bánki Donát Gépész és Biztonságtechnikai Mérnöki Kar Slovak

² University of Technology in Bratislava
MIG apparatus voltage/current sign registration in case of different welding parameters

Biró Szabolcs¹- Horváth Richárd¹- Bogdan Słodki²

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ESZTERGALAPKÁK FORGÁCSTÖRÉSI KÉPESSÉGÉNEK KORSZERŰ VIZSGÁLATA

Az esztergaszerszámok forgácstörési képességének vizsgálati eredményei fontosak mind a szerszámminnovációt végrehajtó gyártók, mind pedig a felhasználók számára. A gyártók (és forgalmazók) felkérésére végzett, szisztematikusan megtervezett és végrehajtott forgácstörési kísérleteink sok tapasztalatot hoznak, a belőlük levonatott következtetések pedig egy újabb, egy következő szerszámfejlesztés irányait is kijelölhetik. A forgácsképződés kutatását kiterjedt nemzetközi együttműködéssel, a legkorszerűbb eszközökkel és vizsgálati módszerek alkalmazása mellett végeztük, amelyről néhány szemelvényt mutatunk be az előadásunkban.

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EFFECT OF SURFACE ROUGHNESS FOR TRIBOLOGICAL BEHAVIOUR OF ENGINEERING POLYMERS

Tribological behaviour - friction, wear and lubrication - of machine elements highly depend on the operating state and also the original topography of working pair. Counterparts of engineering polymer elements many times are much more harder than the polymer ones, so their topography highly influence the tribological behaviour. In this study friction and wear experiments and surface roughness measurements were performed. Investigations extended to wear in the course of the non-lubricated PA6-steel, PET-steel and POMC-steel material pairs. Steel surfaces was grinded with and without last zero advance. The main goal was to analyse the effect of steel surface in frictional and wear behaviour of polymers.

Tállai Péter - Csuka Sándor

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KORSZERŰ PVD-BEVONATRENDSZEREK ALKALMAZÁSA KÖRNYEZETBARÁT MENETFORMÁZÁSKOR

A menetformázást főleg a kis szilárdságú és/vagy nagy nyúlású anyagokból készült munkadarabok megmunkálásánál alkalmazzák elterjedten. A korszerű konstrukciók, növelt teljesítőképességű anyagok és az új bevonatrendszerek megjelenésével a korábbi fenntartások azonban fokozatosan háttérbe szorultak. A vizsgálatot olyan nagyszilárdságú, nemesített állapotú szerszámacélon, PVD-vel bevonatolt szerszámokkal végeztük, ahol a formázó minimálkenéssel, azaz környezetbarát módon dolgozott. Kimutattuk azt, hogy a formázó menetszelvényein megjelenő maximális kopás és/vagy anyagfelrakódás, valamint a szükséges nyomatok között egyértelmű a kapcsolat. Sikerült azt is bizonyítani, hogy a különböző, korszerű bevonati rétegek teljesítőképessége elsősorban a formázás sebességétől függ. A vizsgálatsorozat alapján kijelölhetők azok a körülmények, amelyek tartásával az egyes bevonatoktól optimális teljesítményt várhatunk.

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TÖBBLÉPÉSES KÉPLÉKENYALKÍTÁSI-HŐKEZELÉSI STRATÉGIÁK SORÁN KIALAKULÓ MIKROSZERKEZET JELLEMZÉSE

Az egyre nagyobb érdeklődést az alacsony energiájú ún. $\Sigma 3^n$ ($n=1, 2, 3$) CSL (coincidence site lattice) szemcsehatárok és kialakulásuk körülményei iránt a témában írt tanulmányok növekvő száma jelzi. A szemcsehatárok tulajdonságait befolyásoló kezelések képlékeny hidegalakításból és egy azt követő hőkezelésből állnak, néha többször megismételve a lépést.

Jelen munkánkban az egy- és többciklusú kezelések hatásait vizsgáljuk polikristályos Cu-ETP réz szemcsehatár szerkezetére. Húzott négyzet rudakat hengereltünk nagy alakváltozást létrehozva, majd közepes hőmérsékleten újrakristályosítottuk ezeket, a lépéseket többször megismételve. Orientációs mikroszkópia eszközeinek segítségével számítottuk a szemcsehatár tulajdonságok eloszlását. Megmutatjuk az összefüggéseket a szemcsehatár-szerkezet alakulása, illetve a kezelések paraméterei (alakítás mértéke, lágyítás hőmérséklete) és a lépések száma között.

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SCRATCHES DETECTION OF WORN SURFACE WITH THE HELP OF THE PROFILE MATERIAL PROPORTION (RMR) ROUGHNESS PARAMETER SPECIAL EXTENSION TO THREE DIMENSIONS

The most of roughness parameters which can be used to characterize the machined surfaces do not define the wear marks of the sliding surfaces. These parameters - on account of average calculation - change not significantly in the wear processes. The extension of the microtopography parameters from two dimensions to three dimensions does not describe perfectly the local wear marks in abrasive case.

In this paper I introduce a profile parameter named material proportion new explanation in three dimensions and I localize the scratches with this new parameter.

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MIG APPARATUS VOLTAGE/CURRENT SIGN REGISTRATION IN CASE OF DIFFERENT WELDING PARAMETERS

In case of the thin sheet welding is very important to knowledge of the drop transfer. The most welding machine company has an own special technology to assure the welding parameters in case of special situation. The fast regulation by time the current intensity and the arc power give us a special sign form what we can't measure by the traditional technique. These signs measurement can be made by the digital oscilloscope.

Usually the companies who make the welding apparatus give only some parameters what are not enough to apply the apparatus for the waited arc. It's need to do some test. The results of the tests can give a voltage-power sign, which help to control the arc and the drop transfer during the welding in case of standard welding parameters.

MACHINE DESIGN SECTION

GÉPÉSZETI SZEKCIÓ

Chairman - Elnök: Sándor Horváth

1. Csilla Erdősne Sélley - Gábor Körtélyesi

Budapest University of Technology and Economics
Budapesti Műszaki és Gazdaságtudományi Egyetem
Machine design methodology with topology and shape optimization

2. Dániel Fenyvesi

Óbuda University, Bánki Donát Faculty of Mechanical and Safety Engineering
Óbudai Egyetem Bánki Donát Gépész és Biztonságtechnikai Mérnöki Kar
Effects of tip gap size in a straight bladed axial fan cascade at the design flow condition and determination of the optimal tip clearance size at present study

3. Dániel Fenyvesi

Óbuda University, Bánki Donát Faculty of Mechanical and Safety Engineering
Óbudai Egyetem Bánki Donát Gépész és Biztonságtechnikai Mérnöki Kar
Equation of mixing losses at the downstream of an axial flow fan rotor

4. Judit Szalai

Budapest University of Technology and Economics
Budapesti Műszaki és Gazdaságtudományi Egyetem
Fiber reinforced composite bus bumper design development with finite element analysis

5. Horváth Richárd – Palásti Kovács Béla – Sipos Sándor

Óbuda University, Bánki Donát Faculty of Mechanical and Safety Engineering
Óbudai Egyetem Bánki Donát Gépész és Biztonságtechnikai Mérnöki Kar
Optimális szerszámválasztás alumíniumöntvények környezetbarát finomsztergálásához

6. Salamon Árpád

Tech-Con Hungária Kft.

Az Alumínium profilrendszerek felhasználása az iparban

7. Csuka Sándor¹, Pálfalvi Bálint², Sipos Sándor¹, Mózes András¹

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Korszerű marók forgácsolási adatainak többcélú optimalása

8. Mónika Bakosné Diószegi

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Biogas laboratory at Óbuda University

9. Legeza László

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Biomassza erőművi hamu hasznosítása

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MACHINE DESIGN METHODOLOGY WITH TOPOLOGY AND SHAPE OPTIMIZATION

Much research has focused on optimization techniques, but few concentrate on real life problems. Here we discuss the modelling aspects of topology and shape optimization methods due to the difficulties arising from the coupling of these methods in the design process. We propose a design methodology which offers to incorporate designer knowledge about manufacturability as well as high-end software tools of reverse engineering to formulate a parametric geometry on the results of the topology optimization. The application of shape optimization shows that parametric representation must be refined on the basis of the results of structural analysis. The main steps of the methodology will be demonstrated through solving a real design task. The proposed technique allows fitting the design space to the design intent in a highly efficient way.

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EFFECTS OF TIP GAP SIZE IN A STRAIGHT BLADED AXIAL FAN CASCADE AT THE DESIGN FLOW CONDITION AND DETERMINATION OF THE OPTIMAL TIP CLEARANCE SIZE AT PRESENT STUDY

This article presents the detailed study of rotor tip leakage related phenomena in an axial fan for without gap and five clearances configuration. In the light of global hydraulic efficiency and relative stagnation pressure losses the author's proposal is interpreted about the optimum tip gap size at present axial fan cascade of non-free vortex design in this paper.

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EQUATION OF MIXING LOSSES AT THE DOWNSTREAM OF AN AXIAL FLOW FAN ROTOR

The dimensionless pressure and velocity components of mixing losses equation represents the deviation of the flow field from design ("primary") condition. The primary flow field at given radius come from infinite straight linear cascade investigation with the help of computational fluid dynamics. The deviate between the design and real cascade flow occur the 3D viscosity effects. Therefore this article introduces the typical 3D viscosity effects in the rotor cascade on the basis of specialized literature. The equation of mixing losses is suitable for estimating the flow fan rotor cascade goodness.

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FIBER REINFORCED COMPOSITE BUS BUMPER DESIGN DEVELOPMENT WITH FINITE ELEMENT ANALYSIS

A more protective and economical bumper is always a necessity for the automotive industry.

The purpose of the paper is to present a finite element analysis for the development of a high dense energy absorbing fiber reinforced composite bus bumper.

With the aid of this analysis, deformations caused by crashes can be calculated on different bumper geometries supporting an optimal bumper design.

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OPTIMÁLIS SZERSZÁMVÁLASZTÁS ALUMÍNIUMÖNTVÉNYEK KÖRNYEZETBARÁT FINOMESZTERGÁLÁSÁHOZ

A környezetvédelem érdekében a nagysorozatban előállított autóiipari alkatrészeknél meg kell változtatni a gyártási műveleteket. Az előadás összegzi a szerzők e területen esztergáláskor szerzett tapasztalatait. A szisztematikusan megtervezett, végrehajtott és dokumentált kísérletsorozat alapján meghatározzák azokat a gyártási körülményeket, amelyekkel a nagy szilíciumtartalmú öntött alumíniumöntvények finomesztergálásakor a legkedvezőbb érdességi paraméterek érhetőek el. A felületek topográfiai vizsgálatának célja a megmunkált felületek működés közbeni viselkedésének leírása, ezért meghatározzák a gyémánttal megmunkált felület topológiai térképét is. Nemcsak a szerszámanyag és az élkialakítás legkedvezőbb változatait határozzák meg, hanem az előírásoknak megfelelő forgácsolási adatokat is.

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AZ ALUMÍNIUM PROFILRENDSZEREK FELHASZNÁLÁSA AZ IPARBAN

Célom az Alumínium profilrendszerek bemutatása a hallgatóságnak az általunk forgalmazott ITEM gépépítő rendszeren keresztül. Kitérek a profilok gyártástechnológiájára, a profilokkal szemben támasztott követelményekre illetve azok előnyeire a hegesztett rácsszerkezetekkel szemben. Ismertetem a rögzítési és szerelési lehetőségeket is. Példákon keresztül bemutatom a rendszer felhasználási területeit. Megismertetem a hallgatósággal a tervezési lehetőségeket CAD/CAM rendszerben, végezetül beszélek néhány szót a jövő lehetőségeiről.

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KORSZERŰ MARÓK FORGÁCSOLÁSI ADATAINAK TÖBBCÉLŰ OPTIMÁLÁSA

A korszerű szárasmarók alkalmazásának elengedhetetlen feltétele a forgácsolási körülmények kellő ismerete, a korlátfüggvényekre épülő folyamatmodell megalkotása és a beállítási adatok optimálása. Az elvégzett forgácsolási kísérletek arról tanúskodnak, hogy a kiválasztott különböző konstrukciójú szerelt szerszámok eltérő mértékben alkalmasak az egyes feladatokra. A marókra meghatározott beállítási adatokat két célfüggvény szerint optimáltuk, amelyek a felhasználó és a termékminőség szempontjait egyaránt figyelembe veszik. Az üzemeltető szempontjából a lehető legkisebb fűorsóterhelés a cél, a gyártmány minősége pedig a lehető legnagyobb pontosság elérését követeli meg. A kidolgozott módszer alkalmas arra, hogy a forgácsolási körülményeket a két szempontot összehangolva állítsuk be. Ráadásul a végrehajtott kísérleteknél előtérbe kerültek a környezetbarát gyártás (green manufacturing) szempontjai is.

Bakosné Diószegi, Mónika

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BIOGAS LABORATORY AT ÓBUDA UNIVERSITY

This study explores relationships between the biogas laboratory under construction at Donát Bánki Faculty of Mechanical Engineering and Security Technology of Óbuda University and the training courses conducted at the Faculty's Institute for Machine Design and Security Technology. It examines the modern curriculum of theory and practice based on laboratory equipment in terms of engineering skills and lexical knowledge. It discloses topics to study in the framework of Scientific Student Circles and degree projects as well as R&D opportunities provided by the state-of-the-art fermentation laboratory and the associated measurement options. Furthermore, the laboratory development project contributes to PhD student support for research and development.

**ERGONOMICS, OCCUPATIONAL HEALTH AND SAFETY
SECTION
ERGONÓMIA, MUNKAVÉDELMI_SZEKCIÓ**

Chairman - Szekcióelnök: Gyula Szabó

1. Borhidi Gábor

MEDOSZ Szövetség
Karbantartás a munkavállalók szemével

2. Edina Gábor

Eötvös. Loránd University
Eötvös Loránd Tudományegyetem
Influence the psychosocial factors at workplaces by the positive psychology's exercises

3. Nagy Imre

Hungarian Institute of Occupational Health
Országos Munkahigiénés és Foglalkozás-egészségügyi Intézet
Munkavédelem – foglalkozási rákkeltő anyagok

4. Edit Németh

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New type of office work hazards

5. Sándorné Nyerges

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Development of construction work accident of the last five-year-period in Hungary
the according to accident reports

6. Gyula Szabó

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Contributing factors of the risk of work-related musculo-skeletal disorders

9. Endre Szűcs – Sándor Horváth

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Occupational Health and Safety training for teaChairmans

10. Zita Farkas, Lóránt Fodor

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Public Transport Accessibility Analysis in Regard to Disabilities

11. Zita Farkas, Lóránt Fodor

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AAC Technologies to Help Public Transportation for People with Disabilities

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KARBANTARTÁS A MUNKAVÁLLALÓK SZEMÉVEL

A karbantartás az egyik legbalesetveszélyesebb munkafolyamat, ezért különösen fontos annak gondos előkészítése és a munkafolyamat folyamatos figyelemkísérése, ellenőrzése. Nem minden munkavállaló alkalmas fizikailag, szellemileg, ergonómiailag, vagy éppen egészségügyi szempontból célzott karbantartási feladat ellátására, ebből adódóan fontos feladata a munkáltatónak, a karbantartó személyeknek, illetve személyeknek, mindenre kiterjedő gondos kiválasztása. A karbantartási munkát végzők -amennyiben megfelelnek a fenti feltételeknek - alapos munkavédelmi képzésben, oktatásban kell részesíteni, a karbantartási feladat kockázatértékelésének eredményéről, a technológiai leírásban foglaltakról, az ahhoz a feladathoz szükséges egyéni védőfelszerelések használatáról. Elengedhetetlen az elvégzett munka befejezésével az elvégzett karbantartási munka kiértékelése, a szerzett tapasztalatok elemzése, az értékelés eredményének - munkavédelmi oktatás keretében való - közzététele.

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INFLUENCE THE PSYCHOSOCIAL FACTORS AT WORKPLACES BY THE POSITIVE PSYCHOLOGY'S EXERCISES

The psychosocial factors became important in the last decade. The most approach focus on risks, but it could be also viewing from the positive point. The positive psychology is a very good approach, which can be very useful also in the workplaces. This presentation describes thirteen exercises based on positive psychology theory and research designed to improve relationships among people in the workplace and make them more appreciative and respectful of one another, what improves the psychosocial factors at workplaces.

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MUNKAVÉDELEM - FOGLALKOZÁSI RÁKKELTŐ ANYAGOK

A daganatos megbetegedések gyakorisága és/vagy abszolút esetszáma világszerte növekszik. Az utóbbi öt évben megjelenő közlemények a daganatos megbetegedések gyakoriság-növekedését jelzik! Az Egyesült Államokban két férfi közül egy, három nő közül több mint egy esetében diagnosztizálnak élete során rosszindulatú daganatos megbetegedést. Ugyan meghatározó okként az az életkor meghosszabbodása és a diagnosztikai eszközök fejlődése (nem kizárólagosan) jelölhető meg, de számos más adat utal arra, hogy a háttérben első sorban nem az életmódbeli tényezők, hanem a környezeti (munkakörnyezeti) karcinogén anyagok számának, expozíciós szintjének növekedése áll.

Egy társadalom alapvető célja, hogy a kockázatok minimálisra csökkentésével a munkavállalók védelmét elősegítse a rákkeltő és mutagén anyagok okozta foglalkozási eredetű egészségkárosodásokkal, illetve daganatos megbetegedésekkel szemben. Az előadás összefoglalja a legfontosabb ismereteket és megelőzési lehetőségeket e foglalkozási megbetegedési csoport esetében, ismerteti hazai előfordulásukat.

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NEW TYPE OF OFFICE WORK HAZARDS

The dangers emerged with the penetration of computers into office work are well-known. However the current regulations, the risk management methodologies used still based primarily on the classic office work with a desktop computer and CRT.

In recent years, physical and organizational work in the office environment has changed considerably, for example spread of telecommuting, work from home and part-time work, portable computers, or appearance of new input and display modes.

In this paper the old and new dangers are shown that are considered main risks of working in the office today.

Sándorné Nyerges

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DEVELOPMENT OF CONSTRUCTION WORK ACCIDENT OF THE LAST FIVE-YEAR-PERIOD IN HUNGARY THE ACCORDING TO ACCIDENT REPORTS

People spend the majority of their lives as employees at their jobs. Recently every facility, device, machine, workplace has been designed to be a major concern in preventing work accidents. Many serious or even fatal accidents occur as a consequence of violating fundamental rules and negligence of prescribed protection equipment.

It is remarkable that the number of occurrences in building industry and agriculture is relatively low, but that of fatal accidents are extremely high. The tendency of casualties in building industry is fortunately decreasing. During the first half of the year 2007 twenty-five fatal accidents occurred compared to ten in the same period of 2011.

The author is presenting three fatal work accidents in building industry. All could have been avoided, if safety rules had been enforced, if employers had inspected and employees had used individual protection equipment.

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CONTRIBUTING FACTORS OF THE RISK OF WORK-RELATED MUSCULO-SKELETAL DISORDERS

The exercise-induced musculo-skeletal disorders represent a major risk in the workplace. A possible way of risk management in machines develop is included in the harmonized European standard series "BS EN 1005 Safety of machinery. Human physical performance".

Although the risks of the manual handling, the force limits, body postures and movements, and high-frequency repetitive activities are separately determined by the standard, these and other amendments factors together, and mutually influencing determine the risk of work.

In the paper the contributing factors of physical risk are identified according to the standard series and their context is shown.

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OCCUPATIONAL HEALTH AND SAFETY TRAINING FOR TEACHAIRMANS

The topic of occupational safety and health is not included in the mandatory professional teacher training. This practical significance gap is filled by the Óbuda University with the support received on the „tender for the use of health and safety fines”. The content of the new training ensures that both the occupational safety and health professional and the teachers’ training requirements will be achieved.

In the course the didactic elements that promote occupational safety and health in education are discussed with teachers’ colleagues. The professional part of the course includes legal and technical basics, and special issues of safety and health at work to ensure that the participants possess adequate knowledge to continue their work. One training day is dedicated to a practical training when participants proof their ability to use their OSH knowledge with completing an exercise project.

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PUBLIC TRANSPORT ACCESSIBILITY ANALYSIS IN REGARD TO DISABILITIES

This paper analyses mobility needs and travel patterns of individuals with various disabilities in the public transport environment of Budapest. In the paper various accessibility problems and possibilities are introduced, from the ergonomic point of view, through travel planning, wayfinding, access and exit of vehicles.

Ergonomic guidelines and safety regulations aid people with mobility, sensory and cognitive impairments to create passenger friendly outer and inner environment in public transportation.

Today barriers in urban public transport create numerous demands that people with impairments cannot meet. In the paper through anthropometrics, physical environment analysis and design for all guidelines evaluation it is introduced that urban transit facilities need more attention to achieve better social inclusion.

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AAC TECHNOLOGIES TO HELP PUBLIC TRANSPORTATION FOR PEOPLE WITH DISABILITIES

Despite assistive technology advancements disabled people are underrepresented in using them during public transportation effectively. In this paper HCI problems and possibilities are introduced for various disability groups during personal transportation. Herein applications and usage possibilities are introduced in transportation environments from facilitated travel planning, wayfinding within stations, boarding vehicles or using various transit facilities.

Instead of unreliable sources of information, time consuming and tedious tasks in the fast changing environment of public transport, smart phones, robots or wearable interfaces can help seniors and persons with disability to obtain navigational information through cross-sensory interactions.

Barriers of accessibility come from the lack of policies and policy enforcement, technology failures and usability problems that GUI complexity creates. Reduction of controllers, easing interface communication and redundancy are essential for various applications in order to help disabled travelers to focus on instant physical or cognitive tasks during public transport.

SECURITY TECHNOLOGY SECTION

BIZTONSÁGTECHNIKAI SZEKCIÓ

Chairman - Szekcióelnök: Tibor Kovács

1. Tamás Berek

Zrínyi Miklós National Defence University
Zrínyi Miklós Nemzetvédelmi Egyetem
Aspects of security systems design for hazardous materials testing facilities

2. Lajos Berek

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Safety, security technology, safety engineering sciences

3. József Csurgai

Zrínyi Miklós National Defence University
Zrínyi Miklós Nemzetvédelmi Egyetem
Application of airborne radiological reconnaissance in case of searching lost or stolen radioactive sources

4. Imre Elek

Hungarian Institute for Forensic Science/Zrínyi Miklós National Defence University
Bűnügyi Szakértői- és Kutatóintézet Nyomszakértői Laboratórium/Zrínyi Miklós
Nemzetvédelmi Egyetem
50 years in toolmarks' examination duty

5. Tamás Horváth

Hungarian Power Companies Ltd.
Magyar Villamos Művek ZRt.
Application possibilities of thermal cameras

6. Csaba Otti¹ - Arnold Ószi²

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Fingerprint security

7. Ferenc Pehatsek

C&C and Rass Ltd./C&C Rash Kft.
Higher level access to security systems through user surfaces

8. Lajos Szabó

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Event - unusual event

9. Zoltán Vágföldi

HDF 'Artúr Görgei' NBC Information Centre/Zrínyi Miklós National Defence
University
MH Görgei Artúr Vegyivédelmi Információs Központ/Zrínyi Miklós
Nemzetvédelmi Egyetem
Optical spectroscopic handheld chemical identification equipment

10. Hullán Szabolcs

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Hatósági biztonságjeljesítmény-értékelés

11. György Veres¹ - Tibor Kovács²

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Examination of throughput by a computer aided modeling

Tamás Berek

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ASPECTS OF SECURITY SYSTEMS DESIGN FOR HAZARDOUS MATERIALS TESTING FACILITIES

In order to configurate a safeguarding concept, we have to design a complex security system. We have to make a plan, the plan has to be analyzed and interpreted. We have to configurate the right proportion of the protection systems. In laboratories, where hazardous materials, radioactive isotopes are stored and used for a job under the risk of poisoning and ionizing radiation, it is important to comply with the protective measures. The author demonstrates what feature should be taken into consideration because of hazardous materials.

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APPLICATION OF AIRBORNE RADIOLOGICAL RECONNAISSANCE IN CASE OF SEARCHING LOST OR STOLEN RADIOACTIVE SOURCES

Nuclear security is important part of the global security. It unites tasks and missions related to nuclear environmental monitoring, control and reduction of potential sources, nuclear disaster relief, and non-proliferation. The techniques of situation assessment have essential role in monitoring and disaster relief with airborne radiological reconnaissance with digital data processing in the GIS being the most rapid method for the radiological situation assessment.

Based on experimental data, this article reviews the technology and tactical applicability of the airborne radiological reconnaissance with focus on a special task directing to searching lost or stolen radioactive sources. Methodology tests are described which proved that the recent technology of airborne recce gives opportunity to make precise measurement. The study includes described tests, which were completed in different terrain and with radioactive sources of various energies. During tests the minimum activity and energy of the sources was determined and the right method of the reconnaissance was developed.

Keywords: nuclear security, nuclear disaster relief, radiological situation, airborne radiological reconnaissance, GIS

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**SAFETY, SECURITY TECHNOLOGY,
SAFETY ENGINEERING SCIENCES**

Simple, passive and dynamic concepts of safety. Interpretation of security technology. Place and role of safety engineering science in the system of sciences. Narrower and broader interpretation of security technics.

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50 YEARS IN TOOLMARKS' EXAMINATION DUTY

The Institute of Criminal Forensics celebrates its 50th anniversary this year. In 1961 started scientific toolmarks examination with the latest high technology tools in the Hungarian Institute for Forensic Science. In the early 60s a toolmark examiner was able to identify a few perpetration methods, but several modern methods were not known then. The examiner had to face mark-finding difficulties because of the spread of increasingly complex locks and also because of expanding variety and spread of different manipulative opening methods. The biggest problems posed in this field are choosing the relevant component of the mark formation and exploiting marks under a visually detectable limit. Today there are several tools to explore, examine and compare marks on mechanic security devices worldwide. Digital processing of image information content has developed a lot recently, which reforms and provides a higher quality of microscope-scaled toolmarks.

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APPLICATION POSSIBILITIES OF THERMAL CAMERAS

Even professionals of security technology do not meet thermal cameras frequently during their work experience because their usage, not least their cost restrict them for industrial and military use. The human eye is capable of seeing only a very small part of the electro-magnetic spectrum. We are not able to pick up either the UV or IR ranges. High-tech equipment which need. Security professionals discover more and more areas for use of thermal images. It is worth to focus on thermal cameras and some of their main options in more details and settling for the fact that lenses now may be made of metal...

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FINGERPRINT SECURITY

People leave their fingerprint in many places, for example on glasses, photographs, computer mouses, laptop surfaces, latches, doors, desks, vehicle, etc., anything with a smooth surface will do.

In the symposium we will introduce some techniques that might be used to acquire a fingerprint from another person. Then a few successful identification with the template copies will be carried out and demonstrated on a biometrical based access control system.

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HIGHER LEVEL ACCESS TO SECURITY SYSTEMS THROUGH USER SURFACES

Our study concerns non user-level access to safety systems through public interface with tools with seemingly common tools. The discussed systems are for data, property and/or to personal security, they may be mechanical, electronic, therefore as well as guarding protection. Access is successful if the security is breached, that is the protected object is within reach of and there is opportunity for removal, modification, destruction, etc. The average user has privileges only to operate the system, open or close up certain areas, turn switches on and off, but basically the system itself can not be altered. The public interface is accessible to all, however, that is the system boundary, access is possible only with the right tool and/or possession of knowledge. What may that tool and knowledge? This is what we aim to answer.

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EVENT - UNUSUAL EVENT

We often use the expression of “unusual event”, but we never the expression “event”. Why is that so? The answer is simple. There is no definition for "event", however it should be evident. Without a basic definition there is no reason to specify it. How can we provide a scientific explanation? What methods do we have to determine it? Our priority here is to form a definition that is disambiguating for all (policemen, officers, security experts etc.) and can be applicable at any situation.

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OPTICAL SPECTROSCOPIC HANDHELD CHEMICAL IDENTIFICATION EQUIPMENT

The title of presentation covers the importance of the FTIR and FT Raman spectroscopy and handheld designed equipment for fast on-site identification of unknown chemicals used by first responders/hazmat teams. Instruments previously used just for laboratory purposes through continuous development and miniaturization became usable for identification on the spot.

Handheld FTIR and FT Raman systems with built-in spectral database permit reliable chemical identification of unknown, solid and liquid complex mixtures including explosives, toxic industrial materials and chemical warfare agents.

The degree of the identification essentially depends on the reliability and the number of the spectral data library (e.g. quality and quantity of data stored).

This lecture explains the theory of the optical spectroscopic phenomenon, compares the design of both laboratory and handheld spectrometers, and finally describes their limitations.

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EXAMINATION OF THROUGHPUT BY A COMPUTER AIDED MODELING

Application of simulations of computer aided modeling for throughput can be used for examination of small but significant details. The throughput factor is one the most remarkable components during practical calculations. In our presentation we are modeling 36 scenarios.

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Hatósági biztonságjeljesítmény-értékelés

The system of Safety Performance Indicators has become an essential tool for the regulator to assess the licensee's performance. The Hungarian Atomic Energy Authority (HAEA), the safety regulatory body of the Hungarian nuclear facilities, uses an indicator system to assess the licensees since 1995. That system was mainly created to assess the occurred, not planned events. The assessment method was partly reconstructed in 2000, when the system used for the Paks Nuclear Power Plant was modified taking into consideration the International Atomic Energy Agency "TECDOC" 1125 and the enhanced performance indicator system was extended to cover the other three nuclear facilities.

The safety performance indicators are assessed by the HAEA according to criteria defined individually for each of the indicators, and colour codes are assigned. The HAEA has defined four (red, yellow, green, white) ranges in order of assessing and the related regulatory activities.

The HAEA has created the assessment criteria of the safety performance indicators in a way, the criteria considers the safety performance level reached by the nuclear facility and the national and international experience related to the use of nuclear energy, as well as to help the licensees to improve their safety performance.