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DYNAMICAL BEHAVIOUR ANALYSIS OF ENERGETIC TRANSFORMERS USING DIGSILENT PROGRAM

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Abstract: Dynamical behaviour analysis of energetic transformers is presented in this paper. Physical and basic mathematical background necessary for dynamical behaviour analysis is explained. Case of switching unbiased transformer on grid and switch current analysis are described. Switch voltage appearance in cases transformer switching and breaking from grid in normal drive is explained. Simulations of energetic transformer switching and breaking from grid using DIgSILENT program is given.

Key words: analysis, switching, transformer, simulation, DIgSILENT.

1. INTRODUCTION

The main topic of this paper is model for testing power transformer in cases of inrush current appearance, when unloaded transformer is switched on grid, and case of appearance of switch voltage in normal drive. This testing is made in DIgSILENT program on 50 MVA power transformer. The term power transformer (Fig. 1) is used to refer on those transformers used between the generator and distribution circuits, and these are usually rated at 500 kVA and above (Sim & Digby, 2004). Inrush current is the magnetizing current that creates during switching of unloaded transformer on grid (Kelemen, 1997). Inrush current appears because of residual flux that remains in the core due to the properties of the magnetic core materials. Magnitude of this current can be 3.5 to 40 times bigger then rated full-load current and can cause many problems. This inrush current can have an effect on the operation on relays and fuses located in the system near the transformer (Sim & Digby, 2004). Model for testing transformer on inrush current is also made in ATP program (Maric, et all., 2006) where presented results can help in prevention of undesirable effects that inrush current causes. Controlled switching can reduce the undesirable effect of inrush current. The actual controlled switching devices operate with high voltage circuits breakers but only in normal cases: usual manual switching of network components like power transformers, lines loads, etc. (Munteanu, 2006).

The other problem that is explained in paper is the appearance of switch voltage that creates when transformer is switched on or off grid. Because of its high frequency, speed and magnitude switch voltage can cause problems on grounded areas of transformer.

Fig. 1. Three phase 20 MVA power transformer

2. INRUSH CURRENT

The waveform of typical inrush current (Fig. 2a) displays a large and long lasting DC component, rich in harmonics, assumes large peak values at the beginning (up to 30 times the rated value), decays substantially after a few tenth of a second but its fully decay occurs only after several seconds to the normal excitation level of 1 – 2 % of rated current (Maric, et all., 2006). The peak of inrush current is limited only by the air-core reactance (Fig. 2b) and it depends of coil inductance L. Therefore, the peak inrush current is expressed in the cgs system of units as follows (Winders, 2002):

\[ I_{peak} = \frac{\phi_s + 2\phi_r + \phi_n}{0.4\pi N/\phi_n} \times 10^3 \quad (1) \]

where \( \phi_s \) = residual flux, \( \phi_n \) = normal flux change, \( \phi_s \) = saturation flux and \( N \) = number of turns in the coil.

3. SWITCH VOLTAGE

Switch voltages are transition stages in grid and they appear (for example) when we have two circuits (Fig. 3) with transformer (presented with \( R_x \) and \( L_\sigma \)) on one side and load on the other side (presented with \( L_2 \) and \( R_2 \)). After circuit brake, because of capacity \( C_1 \) and \( C_2 \), between transformer and load difference voltage is created. This difference appears on circuit breaker and can cause such amounts (2 to 3 time of nominal voltage value) that can deprodate isolation of transformer, load and circuit breaker. For the voltages on capacitors \( C_1 \) and \( C_2 \) after circuit breaking relation (Kelemen, 1997) that shows significant values of switch voltage is:

\[ u_{C1}(t) = u_{C2}(t) = \Delta u_0 \cos \omega t + \Delta U \left[ \frac{L_2}{2} \sin \omega t \right] \quad (2) \]

Fig. 2. Inrush current a) and unloaded transformer scheme b)

Fig. 3. Circuit break with loaded transformer
where $u_C(t)$ is stationary voltage value on capacitor, $\Delta u_0$ is difference between voltage value before circuit brake ($t = 0$ s) and $u_C(0)$, $\Delta i_0$ is momentarily current value trough circuit breaker in the moment of opening, $\sqrt{\frac{1}{C}}$ is wave resistance of circuit, $\nu$ is frequency and $T = 2L/R$ is time constant of circuit. Time duration of wave is few hundred micro seconds.

4. EXPERIMENTAL MODEL

Experimental model (Fig. 4) for switching unloaded transformer on grid (where inrush current is been recorded) and breaking of loaded transformer (where switch voltage is been recorded) consists of generator (60 MVA), generator transformer (Tr 1, 50 MVA), bus (110 kV) and tested transformer (Tr 2, 50 MVA) with consumers on LV 10,5 kV side.

Testing of transformer is done in DlgSILENT program that is engineer software tool for analysis industrial, distributional and commercial electrical girds. Programming in DlgSILENT starts by defining of all elements given in scheme on Fig. 4. Work window (Fig. 5) consists of Main window - 1, Data manager window - 2, Graphic window - 3 and Output window - 4. Basic data about tested and generator transformer are entered by pressing 2-Winding Transformer order. The model of tested transformer (Tr 2) and other elements are real and DlgSILENT program provides entering of all known data of tested model elements by simple click on each element. By pressing on command Load Flow data about magnetize current and magnetize losses are given. This data is relevant for inrush current determination.

5. RESULTS

Switch of unloaded transformer was started at 0.5 s from the beginning of simulation on HV – 110 kV side (Fig. 6). In the beginning current is 2.8 times higher from nominal value (262 A). Time that is necessary for inrush current droop on 50% value of maximum amplitude is 72 s for 50 MVA power transformer (Kelemen, 1997). Loaded transformer switch off is done at 0.5 s on LV-10.5 kV side. On Fig. 7 switch voltage and current amplitude drop is given. Amplitude of switch voltage is 6.0 kV. Voltage amplitude drops on nominal value after few hundred micro seconds.

6. CONCLUSION

DlgSILENT program provides real testing of observed 50 MVA energetic transformer on appearances of inrush current and switch voltage. By settings on the tested model the worst case scenario for inrush current can be tested. This is the case when switch of transformer occurs when voltages in all three phases are passing trough zero. Also important is transformer testing on switch voltage because this testing provides information about switch voltage magnitude that can occur on circuit breaker and transformer. Combined testing on model and implementation of results provided by real measurement can give good results and evaluation of transformer dynamical behaviour analysis.

7. REFERENCES


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(Jyri Papstel 1996)

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SKOČZYNSKI, Waclaw
SKOLUD, Bozena
SLUGA, Aloid
SOFONEA, G. Aurel
STARCIVIC, Gordan
STOPPER, Markus
STUJA, Kemal
SYSAI, Tomas
TADAMURA, Katsumi
TAKALA, Josu
TOMASIC, Zelko
TAN, Kok Kiong
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TRUNSTEIN, I.
TSUZUKI, M. S. G.
ULRICH, Günther
VAARIO, Jari
VAMOS, T.
VASEK, Vladimir
VEZA, Ivica
VISEKRUNA, Vojo
VOSNIAKOS, George C.
WEIGANG, Wu
WEIGL, K. Heinz
WINKLER, T.
Xue, D.
YAMAZAKI, K.
YOSHIIDA, Susumu
YU, Y.-C.
ZAMPIRA, C. Sorin
ZAJAC, Jerzy
ZAPCIU, Miron
ZHANG, Guangming
ZICHIL, ValentíN
YOUNG RESEARCHERS’ AND SCIENTISTS’ INTERNATIONAL COMMITTEE FOR 2007

The main aim of this International Committee is international promotion of talented young researchers and scientists. Target group are: young engineers, master students, young master, doctoral students, young doctors, talented graduate students and other tolerant and talented young persons from one of the fields of interests of DAAAM International. The young winners of Best Paper Award of DAAAM International are also the member of this committee. The candidate has to be under age 35 years and has to be author or co-author of paper published in one of DAAAM publications. The candidate has to be nominated by the supervisor/professor/team leader. The nomination (short CV, research: status, field, course, targets, results) has to be send to the President of DAAAM International.

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ANDRIČ, BERISLAV
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BAGIMOV, IGOR
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ZBRANEK, PAVEL
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DARKO, CSABA  KREMNIJAK, ZVONKO  MURESAN, VASILE  YOSHIDA, HI.
DENONA, MARKO  

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<td>Josip Juraj Strossmayer University of Osijek</td>
<td>The members of Permanent Committee have to be nominated by Budapest University of Technology and Economics</td>
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<td>Kobe University, Kobe</td>
<td>Professor Dr. sc. Dragomir Krumes</td>
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<td>Moscow State University of Technology &quot;Stankin&quot;, Moscow</td>
<td>Director, Chair and Professor Kanji Ueda</td>
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<td>President, Professor Dr. Sci. (tech.) Member of Russian Academy of Science Juri M. Solomentsev, O. Univ. Prof. Dipl.-Ing. Dr. techn. Dr. h.c. Sergey Egorov</td>
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<td>Technical University of Kosice, Kosice,</td>
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<td>University of Maribor, Maribor</td>
<td>Dean Prof. Dr.Eng. Petru Berce, Prof.dr.Eng. Csaba Gyenge</td>
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<td>University of Miskolc, Miskolc</td>
<td>Prof. Ing. Karol Florian, DrSc., Prof. Dr. Emil Wessely</td>
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<td>University of Mostar, Mostar, Bosnia and Herzegovina</td>
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<td>University of Split, Split</td>
<td>Professor Dr.-Ing. Dr.h.c. mult. Jozsef Cselenyi, Professor Dr Gabor Terstyanyszky</td>
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<td>University of Zagreb, Zagreb</td>
<td>Rector Prof. Dr. Vladu Majstorovic, Prof. Dr. sc. Vojo Visekruna</td>
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<td>University of Split, Split</td>
<td>Vice-Rector Prof. Dr. Ahmet Geca, Prof.-Dr. Bajrush Bytyci</td>
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<td>University of Zagreb, Zagreb</td>
<td>Professor Josip Brnic, Ph.D., Professor Zoran Mrsa, Ph.D.</td>
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<td>University of Zagreb, Zagreb</td>
<td>Rector Professor Dr. Ivan Pavic</td>
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<td>University of Zagreb, Zagreb</td>
<td>Rector Professor Dr. Aleksa Bjelis</td>
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DAAAM INTERNATIONAL VIENNA:
BACKGROUND, HISTORY, AIMS, STRUCTURE, ACTIVITIES & FUTURE

Branko KATALINIC
President of DAAAM International
www.daaam.com / www.daaam.org

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2.0 Aims
3.0 Organisation – National Presidents – International Coordinators
4.0 DAAAM Symposia Authors’ Club
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1.0 BACKGROUND

The DAAAM International was founded and based on the idea and initiative of Professor B. Katalinic, on November 5th, 1990, at the Vienna Symposium, which was organised in order to mark the 175th anniversary of the Vienna University of Technology.

The purpose of DAAAM International is to provide a world forum for engineers, scientists and industrial managers to present and discuss the current status and impact of advanced manufacturing and automation.

During the last seventeen years, the activities of DAAAM International have been supported by scientists and experts from over fifty countries all over the world. In the course of the last five years, DAAAM International has focused activities on the regional and global long-term cooperation between (technical) universities. The result of this initiative is the founding of the University Network of DAAAM International Vienna and DAAAM International Network for Advanced Technologies which was founded on 2002-10-25 in Vienna.

2.0 AIMS

The main aims of DAAAM are:

• To organise an annual DAAAM International Symposium each year.
• To found and organise the University Network of DAAAM International Vienna as a strategic alliance and permanent international open platform for long-term cooperation and partnership in all fields of technology, research and education.
• To organise long-term projects, initially known as Inter-university Doctoral Studies
• To organise a pilot project, initially known as the Virtual University.
• To enable and promote the exchange of people, scientific, and technical information.
• To enable and promote international co-operation among scientists and engineers.
• To enable and promote R & D, education and industrial application.
• To co-operate with other national and international organisations in matters of common interest.
3.0 ORGANISATION OF DAAAM INTERNATIONAL VIENNA

DAAAM International Vienna

President:
Branko Katalinic

Vice presidents for 2007
Joze Balic / Andrew Kusiak / Toma Udiljak / Kanji Ueda

Honour Vice presidents for 2007
Ferenc Alpek / Jaroslav Balate / Klaus Meißner / P. C. Pandey / Janez Peklenik / Emil Wessely

International Senior Adviser for 2007
Franci Cus / Vladimir Filaretov / Malik Kulenovic

Secretary
Paulina Cesarec
Team
Branko Katalinic / Paulina Cesarec / Liane Höller / Roman Kettler / Markus Stopper / Kemal Stuja / Monika Wegner

Presidents and Vice Presidents* of National DAAAM Organisations for 2007

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<td>Denmark</td>
<td>Arne Bilberg</td>
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<td>Germany</td>
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<td>Kazakhstan</td>
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<td>Republic of South Africa</td>
<td>Glen Bright</td>
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<td>Romania</td>
<td>Costel Emil Cotet*</td>
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<td>Portugal</td>
<td>Fernando M. M. Cruz</td>
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<td>Canada</td>
<td>Mahmod Dikic</td>
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<td>P. R. China</td>
<td>Jianhua Dong</td>
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<td>Slovenia</td>
<td>Igor Drstvensek</td>
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<td>Belgium</td>
<td>Joost Duflou</td>
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<td>Brazil</td>
<td>Vladimir I. Dynnikov*</td>
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<td>Russia</td>
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<td>Qing-Yao Han</td>
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<td>Pakistan</td>
<td>Mohammad A. Irfan</td>
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<td>India</td>
<td>Ashutosh Khanna*</td>
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<td>Ukraine</td>
<td>Yurij Kondratenko</td>
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<td>Finland</td>
<td>Petri Kuosmanen</td>
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<td>USA</td>
<td>Andrew Kusiak</td>
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<td>Estonia</td>
<td>Rein Kyttnier</td>
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<td>Poland</td>
<td>Marcin A.Krolkowski</td>
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<td>Spain</td>
<td>Luis Norberto Lopez de Lacalle</td>
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<td>Bosnia and Herzegovina</td>
<td>Vlado Majstorovic</td>
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<td>Iran</td>
<td>Ali Meghdari</td>
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<td>India</td>
<td>P. C. Pandey</td>
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<td>Korea</td>
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<td>Mexico</td>
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<td>Dmitry Srivsky</td>
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<td>Singapore</td>
<td>Kok Kiong Tan</td>
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<td>Kanji Ueda</td>
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<td>Croatia</td>
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<td>Italy</td>
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<td>Greece</td>
<td>George Christopher Vosniakos</td>
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DAAAM INTERNATIONAL VIENNA 2007
DAAAM International Coordinators for 2007

Miroslav Badida  Technical Environmentalistics
Joze Balic  Intelligent Manufacturing
Ivo Cala  Maintenance
Franci Cus  High Education Quality Management
Mahmud Dikic  Assembly Automation
Zvonko Dragecivic  Textile and Garment
Alexey Eliseev  Internet Lab Sharing and Networking
Sergey Egorov  Securities & Financial Management
Vladimir F. Filaretov  Teleoperators
Johann Grabenweger  Material Sciences
Manfred Gronalt  Logistics
Branko Katalinic  Intelligent Manufacturing Systems
Viktorio Malisa  Mechatronics / Robotics
Klaus Meissner  Precision Engineering
Zoran Mrsa  Optimal Shape Design
Jozef Nanasi  Automotive Industry
Markus Stopper  Production Information Technology
Kanji Ueda  Biological Manufacturing Systems
Ante Uglesic  History of Artefacts
Heinz Weigl  Simulation

NB: The further International Coordinators for different topics/fields are needed and welcome, if you want to be one of them please contact the president of DAAAM International

4.0 DAAAM Symposiums Clubs

Since founding of DAAAM International Symposium in 1990 3824 authors and co-authors published at least once their scientific papers in the Annals & Proceedings of DAAAM International Symposium. The members of the club are the persons which presented and/or published their papers at all / not less than 15 / not less than 10 / not less than 5 DAAAM International Symposiums:

All DAAAM Symposiums Authors’ Club
Balic, Joze / Cus, Franci / Katalinic, Branko / Polajnar, Andrej / Veza, Ivica / Wessely, Emil

Members of 15+ DAAAM Symposiums Authors’ Club
Balate, Jaroslav / Boyadjiev, Iliya Kirilov / Buchmeister, Borut / Budic, Ivan / Gyange, Csaba / Udiljak, Toma

2008 Candidates for 15+ DAAAM Symposiums Authors’ Club
Following DAAAM authors are candidates and have a chance to join the 15+ Club in 2008
Alpek, Ferenc / Novakovic, Branko / Velisek, Karol

Members of 10+ DAAAM Symposiums Authors’ Club
Adamczak, Stanislaw / Badida, Miroslav / Bobal, Vladimir / Brezocnik, Miran / Buble, Marin / Dragecivic, Zvonko / Drstvensek, Igor / Dulcic, Zelimir / Grizelj, Branko / Hodolic, Janko / Janac, Alexander / Janacova, Dagmar / Jerbic, Bojan / Kheifetz, Michael / Kljajin, Milan / Kolomaznik, Karel / Kostal, Peter / Koukhta, Sergei Vasilevich / Krolikowski, Marcin A. / Krumes, Dragomir / Kubalci, Marek / Kulenovic, Malik / Kunday, Jonas / Kunica, Zoran / Kuric, Ivan / Leber, Marjan / Mahovic Poljacak, Sanja / Majetic, Dubravko / Majstrovic, Vlado / Malakov, Ivo / Math , Miljenko / Matysek, Miroslav / Meissner, Klaus / Micieta, Branislav / Milfelner, Matjaž / Mrsa, Zoran / Mursec, Bogomir / Nanasi, Jozef / Neumayer, Petr / Nikolic, Gojko / Pahole, Ivo / Papstel, Jiri / Park, Hong-Seok / Pavic, Ivan / Rogale, Dubravko / Siemiatkowski, Mieczyslaw / Szalay, Tibor / Vasek, Vladimir / Visekruna, Vojo / Vranjes, Bozo

2008 Candidates for 10+ DAAAM Symposiums Authors’ Club
Following DAAAM authors are candidates and have a chance to join the 10+ Club in 2008

DAAAM INTERNATIONAL VIENNA 2007
Members of 5+ DAAAM Symposiums Authors’ Club


Following DAAAM authors are candidates and have a chance to join the 5+ Club in 2008

5.0 IN MEMORIAM OF NICE DAAAM COLLEAGUES AND DEAR FRIENDS

Professor Dr Jyri Papstel (1940-2004), Tallinn Technical University, Tallinn Estonia, Vice President of DAAAM International, Founder and President of DAAAM Estonia, Founding member of the pilot projects Interuniversity Doctoral Studies and Virtual University. Member of: International Organizing / Program / Scientific / Review Committees. President of Award Committee. Author. Honored with Medal of DAAAM International Vienna.

M. Sc. Dipl.-Ing. Ivan Ivancic (1952-2004), Ericsson - Tesla, Zagreb, Croatia, International Coordinator for the field Maintenance, Member of International Organizing / Program / Review Committees.

Professor Dr Zdenko Kordic (1949-2004), University of Mostar and University of Split, Founder and First Rector of the University of Mostar, Member of Rectors’ Honor Committee, Founding member of the pilot projects Interuniversity Doctoral Studies and Virtual University. Member of International Program and Scientific Committees. Author. Honored with Medal of DAAAM International Vienna.

6.0 DAAAM INTERNATIONAL MEDAL

On the occasion of 10th DAAAM International Symposium, DAAAM International introduced the Medal of DAAAM International “for excellence in the science, technology, and international scientific co-operation in the framework of DAAAM International Vienna” as a highest recognition for individual persons and institutions. The medal is designed by B. Katalinic, produced by Moscow State Mint Institute and sponsored by Moscow State University of Technology "Stankin" and Cassandra Trust – Ireland. Maximal one person and/or one institution are honoured by medal in one year.

7.0 UNIVERSITY CHARTER OF DUBROVNIK

The text of the University Charter of Dubrovnik: We, the representatives of different Universities and Institutions, after two years preparation at the meeting initiated and organized by The Danube Adria Association for Automation & Manufacturing, DAAAM International under the auspices of The Danube Rectors’ Conference on the occasion of the Eighth International DAAAM Symposium "Intelligent Manufacturing & Automation" held at the International Center of Croatian Universities (University of Zagreb) in Dubrovnik, Croatia, decided to found the University Network of DAAAM International Vienna as a strategic alliance and permanent open platform for long-term co-operation and partnership in all fields of technology, research and education.

The co-operation has to be continuously organized and is based on the partnership, friendship, tolerance, appreciation and positive experience of international scientific co-operation within the framework of DAAAM International during the last eight years. The co-operation can use different flexible forms, structures and aspects. The practical co-operation will be project-based organized. The highest priority is given to the organization of two long - term projects, initially known as: Interuniversity Doctoral Studies and a pilot project Virtual University. Signed by the founding members in Dubrovnik, Croatia, on the twenty-third of October 1997
8.0 DAAAM INTERNATIONAL NETWORK FOR ADVANCED TECHNOLOGIES

The text of the Network founding document: We, the representatives of different Universities, Institutions, and Firms at the meeting initiated and organized by The Danube Adria Association for Automation & Manufacturing, DAAAM International Vienna under the auspices of The Danube Rectors’ Conference on the occasion of the Thirteenth International DAAAM Symposium "Intelligent Manufacturing & Automation: Learning from Nature" held at the Vienna University of Technology and Austrian Society of Engineers and Architects in Vienna, Austria, decided to found the DAAAM International Network for Advanced Technologies as a strategic alliance and permanent open platform within European Research Area for long-term co-operation and partnership in all fields and aspects of research, developing, transfer, education and use of advanced technologies.

The co-operation has to be continuously organized and had to be based on the partnership, friendship, tolerance, appreciation and positive experience of international scientific co-operation within the framework of DAAAM International during the last fourteen years. The co-operation can use individual flexible project oriented forms, structures and aspects and support the young researchers’ mobility as well. The practical co-operation will be project-based organized. The highest priority is given to the organization of long-term international cooperation projects focused on advanced technologies for balanced development and harmony between men, technology and nature. The network has to be platform for dissemination of relevant information and ideas, supporting international partnership and encouraging of cooperation initiatives. Signed by the founding members in Vienna, Austria, European Union, on the twenty-fifth of October 2002

Activity No. 1: The conference bags and flags for DAAAM 2003 in Sarajevo are sponsored by the Faculty of Textile Technology, University of Zagreb, and organised by Professor Z. Dragcevic as the first activity in the frame of DAAAM International Network for Advanced Technologies.

9.0 DAAAM INTERNATIONAL NETWORK FOR MECHATRONICS AND ROBOTICS

The text of the Network founding document: We, the representatives of different Universities, Institutions, and Firms at the meeting initiated and organized by The Danube Adria Association for Automation & Manufacturing, DAAAM International Vienna under the auspices of The Danube Rectors’ Conference on the occasion of the Fifteenth International DAAAM Symposium "Intelligent Manufacturing & Automation: Globalisation - Technology - Men - Nature” held at the Vienna University of Technology and Austrian Society of Engineers and Architects in Vienna, Austria, decided to found the DAAAM International Network for Mechatronics and Robotics as a strategic alliance and permanent open platform within European Research Area for long-term co-operation and partnership in all fields and aspects of research, developing, transfer, education and use of advanced technologies.

The co-operation has to be continuously organized and had to be based on the partnership, friendship, tolerance, appreciation and positive experience of international scientific co-operation within the framework of DAAAM International during the last fifteen years. The co-operation can use individual flexible project oriented forms, structures and aspects and support the young researchers’ mobility as well. The practical co-operation will be project-based organized. The highest priority is given to the organization of long-term international cooperation projects focused on advanced technologies for balanced development and harmony between men, technology and nature. The network has to be platform for dissemination of relevant information and ideas, supporting international partnership and encouraging of cooperation initiatives. Signed by the founding members in Vienna, Austria, European Union, on the fifth of November 2004

10.0 DAAAM INTERNATIONAL SYMPOSIUMS (1990-2007)

One important activity is organising the DAAAM International Symposium. The main objective of the Symposium is to provide a world forum, which takes place annually in Central Europe to exchange knowledge, experience, results and information related to various aspects of the advanced manufacturing and modern automation.

The scope of the Symposium covers scientific, technological and practical concepts concerning research, development and realisation of advanced manufacturing and automation concepts, offering a unique opportunity for experts to meet and exchange ideas. The Symposium is concerned with the current status of automation and manufacturing, methods and results of research and development, as well as application problems and publishes proceedings accordingly.

<table>
<thead>
<tr>
<th>Year</th>
<th>Symposium Title</th>
<th>Date &amp; Place</th>
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<tbody>
<tr>
<td>2007</td>
<td>18th International DAAAM Symposium &quot;Intelligent Manufacturing &amp; Automation: Focus on Creativity, Responsibility, and Ethics of Engineers&quot;</td>
<td>On the occasion of 5th Anniversary of Refounding of the University of Zadar (Founded 1396) 24-27th October 2007, Zadar, Croatia</td>
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DAAAM INTERNATIONAL VIENNA 2007
<table>
<thead>
<tr>
<th>Year</th>
<th>Symposium Title</th>
<th>Date &amp; Place</th>
<th>Organized by</th>
<th>Under the auspices of</th>
<th>Organizer</th>
<th>Publication</th>
<th>Editor</th>
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<tbody>
<tr>
<td>1999</td>
<td>Intelligent Manufacturing &amp; Automation: Past – Present - Future</td>
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<td></td>
<td>Katalinic B.</td>
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</tbody>
</table>
10th International DAAAM Symposium, Last International DAAAM Symposium in this Millennium

21-23rd October 1999, Vienna University of Technology - Department of Production Engineering / Intelligent Manufacturing Systems (IFT-IMS), Austrian Society of Engineers and Architects ÖIAV 1848, Vienna, Austria

Organized by DAAAM International Vienna, Vienna University of Technology, Department of Production Engineering / Intelligent Manufacturing Systems (IFT-IMS)

Under the auspices of Danube Rectors’ Conference & Rectors’ Honor Committee of DAAAM International

In cooperation with Federal Ministry of Sciences and Traffic - Vienna, ÖIAV 1848 Austrian Society of Engineers and Architects


Editor Katalinic B.

1998

9th International DAAAM Symposium "Intelligent Manufacturing, Automation & Networking"

On the occasion of 50 Years of the Technical University of Cluj - Napoca

Date & Place 22-24th October 1998, Technical University of Cluj - Napoca, Cluj - Napoca, Romania

Organized by DAAAM International Vienna, Technical University of Cluj - Napoca, Vienna University of Technology - Department of Production Engineering / Intelligent Manufacturing Systems (IFT-IMS)

Under the auspices of Danube Rectors’ Conference & Rectors’ Honor Committee of DAAAM International

In cooperation with Ministry of Research and Technology - Bucuresti, Federal Ministry of Sciences and Traffic - Vienna, Journal of Intelligent Manufacturing, ÖIAV 1848 Austrian Society of Engineers and Architects


Proceedings ISBN 3-901509-08-9

Editor Katalinic B.

1997

8th International DAAAM Symposium "Intelligent Manufacturing & Automation"

On the occasion of 150 Years of ÖIAV 1848 Austrian Society of Engineers and Architects

Date & Place 23-25th October 1997, ICCU - International Centre of Croatian Universities (University of Zagreb), Dubrovnik, Croatia

Organized by DAAAM International Vienna, University of Zagreb, Vienna University of Technology, Department of Production Engineering / Intelligent Manufacturing Systems (IFT-IMS)

Under the auspices of Danube Rectors’ Conference & Rectors’ Honor Committee of DAAAM International

In cooperation with Ministry of Science and Technology - Zagreb, Federal Ministry of Sciences and Traffic - Vienna, Journal of Intelligent Manufacturing, ÖIAV 1848 Austrian Society of Engineers and Architects, Union of Croatian Universities, Croatian Society - KoREMA - Zagreb.


Proceedings ISBN 3-901509-04-6

Editor Katalinic B.

1996

7th International DAAAM Symposium "Product & Manufacturing: Flexibility, Integration, Intelligence"

On the occasion of 1,000 Years of Austria

Date & Place 17-19th October 1996, Vienna, Austria

Organized by DAAAM International Vienna, Vienna University of Technology, Department of Production Engineering (IFT-IMS)

Under the auspices of Danube Rectors’ Conference

Organizer Katalinic B., Celer S., Fabian E., Nanasi J.

Proceedings ISBN 3-901509-02-X

Editor Katalinic B.

1995

6th International DAAAM Symposium "Intelligent Manufacturing Systems"

DAAAM INTERNATIONAL VIENNA 2007
1994 5th International DAAAM Symposium "Automation and Metrology: Challenge and Chance"
On the occasion of 700 Years of City of Maribor, 35 Years of Faculty of Technical Sciences
Date & Place 27-28th October 1994, Maribor, Slovenia
Organized by DAAAM International Vienna, University of Maribor, Faculty of Technical Sciences
In cooperation with IMECO, Ministry of Sciences and Technologies, Ljubljana
Organizer Balic J., Cus F., Katalinic B., Novak D., Osanna H. P., Sujica M. Z.
Editors Katalinic B., Osanna H.P., Balic J., Cus F.

1993 4th International DAAAM Symposium "Automation and Metrology: Man, Technology, Environment"
On the occasion of 750 Years of City of Brno
Date & Place 16-18th September 1993, Brno, Czechia
Organized by DAAAM International Vienna; Technical University of Brno, Faculty of Mechanical Engineering
In cooperation with IMECO, IUTAM
Editors Katalinic B., Osanna H.P., Balic J., Cus F.

1992 3rd International DAAAM Symposium "Flexible and Intelligent Automation"
Date & Place 4-6th November 1992, Budapest, Hungary
Organized by DAAAM International Vienna; Technische Universität Budapest, Department of Production Engineering
In cooperation with IMECO
Organizer Alpek F., Arz G., Katalinic B., Osanna H. P., Szelig T., Jerzsabek P. Katalinic B.
Editor Katalinic B.

1991 2nd International DAAAM Symposium "Flexible Automation"
Date & Place 9-13th December 1991, Sbrske Pleso, Slovakia, Czechoslovakia
Organized by DAAAM International Vienna; House of Technology, Bratislava; Technical University of Kosice, Faculty of Mechanical Engineering, Department of Automated Production Systems
Organizer Sebo D., Wessely E., Kovacik J., Katalinic B.

1990 1st International DAAAM Symposium „Automatization and Measurement Technique“
On the occasion of 175 Years of Vienna University of Technology
Date & Place 5th November 1990, Vienna, Austria
Organized by DAAAM International Vienna, Vienna University of Technology - Department of Production Engineering / Intelligent Manufacturing Systems (IFT-IMS), ÖIAV, Sections: Measurement and Automation, ASEA, Robotics
Organizer Beer R. J., Osanna H. P., Katalinic B.
Editor Katalinic B.

11.0 BEST PAPER / PRESENTATION DAAAM AWARD

Since 1999 the DAAAM International Vienna recognizes excellence of contributions in a number of ways. There are three categories for papers:

- Best Paper Award of DAAAM International for the best paper presented at Symposium,
- DAAAM International Award for Best Oral Presentation of Paper,
- DAAAM International Award for Best Visual Presentation of Paper.
The Awards are made at the Closing Section and Best Paper Award Ceremony of the Symposium takes part on Friday at 17:00 hours. The Award Committee of DAAAM International makes the evaluation of presented papers during the Symposium. The final decisions are made by the President of the Award Committee of DAAAM International. Former Presidents of the Paper Award Committee of DAAAM International are: 2006 Professor Vladimir Filaretov, 2005 Professor Ueda, 2004 Professor Franc Cus, 2003 Professor Jyri Papstel, 2002 Professor Kanji Ueda, 2001 Professor Toma Udiljak, 2000 Professor Jyri Papstel, and 1999 Professor Kanji Ueda. The President and the final list of the members of the Committee will be announced at Opening Ceremony of the Symposium. All (co)authors of awarded papers are getting the certificate, the paper (main author) additionally getting Best Paper Medal. The layout of the Best Paper Medal you can see at the cover of this publication. The papers which authors are member of the Award committee and the papers which are not presented at Symposium are excluded from competition and can not get the Award.

12.0 DAAAM INTERNATIONAL YOUNG RESEARCHER AND SCIENTIST AWARD

DAAAM International Vienna wants to recognize excellence of contributions of young researchers and scientists, and their supervisors and mentors. Starting with the 1st European DAAAM International Young Researchers’ and Scientists’ Conference, and 18th DAAAM International Symposium "Intelligent Manufacturing and Automation: Focus on Creativity, Responsibility and Ethics of Engineers", which are held 24-27th October 2007 in Zadar, Croatia, the best young researchers and scientists will be honoured by "DAAAM International Young Researchers and Scientist Award" Awards are possible in following categories:

<table>
<thead>
<tr>
<th>Related to:</th>
<th>Categories:</th>
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<tbody>
<tr>
<td>Paper:</td>
<td>Best Paper / Best Oral Presentation / Best Graphic Presentation / Best Poster Presentation / Best Demonstration</td>
</tr>
<tr>
<td>Supervisor / Mentor:</td>
<td>Best Supervisor/Mentor / Best Team Manager / Best Project Manager / Best Leader / Best Female Supervisor</td>
</tr>
<tr>
<td>Quality of Project / Research:</td>
<td>Best Industrial Project / Best Research Project / Best Application / Best Innovation / Best Theory</td>
</tr>
<tr>
<td>Contest:</td>
<td>Interdisciplinarity / European Relevance / Future Oriented / Ethics / Harmony with Nature</td>
</tr>
<tr>
<td>Team:</td>
<td>Best Team / Best University Team / Best Firm / Best International Team / Youngest Team</td>
</tr>
</tbody>
</table>

In the case of extraordinary contributions which can not be expressed by above mentioned recognitions is possible to make a Special Award. The Awards are made at the Closing Section of the Symposium. The final decision is made by President of the Award Committee of DAAAM International for actual year. Former Presidents of the Award Committee are recognised international leading experts and professors. All awarded authors and co-authors of paper are getting attractive DAAAM International Best Award Certificate. The Award Certificates are personal, very nice professional designed, framed and ready to hang in your room. Authors' team is getting one medal named: "DAAAM International Young Researcher and Scientist Award". This Medal is designed by: Branko Katalinic; Sabine Wulffert, and Igor Drstvensek who made the prototype and first edition of medals in 2007. This medal is sponsored by concern Festo. Very Important: The papers which authors are member of the Award committee and the papers which are not presented at Symposium are excluded from competition and can not get the Award.

13.0 FESTO YOUNG RESEARCHERS AND SCIENTISTS SUPPORT SCHOLARSHIP

Since 2007 concern Festo gives, by courtesy of Dr. Wilfried Stoll, support scholarship to excellent young researchers and scientists to present own research results at European DAAAM International Young Researchers’ and Scientists’ Conferences, and DAAAM International Symposiums "Intelligent Manufacturing and Automation". This scholarship covers conference fee, accommodation and (partly) travel expenses. Conditions for wining this scholarship are: candidate must come to conference and must present own research results, candidate must have high quality research and presentation, and candidates have to come from different countries. The winners are getting special "Certificate of Attendance" with special text " …participated as winner of Festo Young Researcher and Scientist Support Scholarship". The awards are made at the closing ceremony, and given by high representative of concern Festo. The first representative for 2007 is Ing. Wolfgang Keiner, general manager Festo Austria.

14.0 BEST DIGITAL PHOTO DAAAM AWARD
Importance of digital photography for research, publishing and social relations is rapidly increased during last time. For that reason we are going to establish DAAAM International Photo Gallery with photos which are related to the symposium and our activities (place, people, situation, art, special effects). The gallery will be free accessed and searchable. For this project we are looking for amateur photographs among the participants to be official photographs of DAAAM International and member of DAAAM International Photo Team. Digital photos can be given during the symposium to the organizer, or send after symposium by e-mail. All photos which are technically good made will be included in the gallery. On the next symposium the up to three authors of nicest photos will get Best Digital Photo Award.

15.0 BEST TASTE AND SMELL OF DAAAM AWARD

"Best Taste and Smell of DAAAM International". Many of colleagues in DAAAM International network are excellent hobby cooks, liquor maker or winemaker. Each year we are making small tasting of their specialities under the motto "Best taste and smell of DAAAM International". Authors are encouraged to bring some self-made specialities to DAAAM symposium. The best will be honoured with "Best Taste and Smell DAAAM International Award".

16.0 DAAAM INTERNATIONAL SPECIALIZED CONFERENCES

<table>
<thead>
<tr>
<th>Year</th>
<th>Conference Name</th>
<th>Founder and Chair</th>
<th>Date &amp; Place</th>
<th>Organized by</th>
</tr>
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<tbody>
<tr>
<td>2007</td>
<td>1st DAAAM International Specialized Conference on Additive Technologies</td>
<td>Katalinic B.</td>
<td>20th April 2007, Celje, Slovenia</td>
<td>DAAAM International Vienna / RAPIMAN – Rapid Prototyping and Innovative Manufacturing Network / Vienna University of Technology - Department of Production Engineering / Intelligent Manufacturing Systems (IFT-IMS), / University of Maribor , Faculty of Mechanical Engineering - Department of Production Engineering / ÖIAV 1848 Austrian Society of Engineers and Architects / University of Applied Sciences - Technikum</td>
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<tr>
<th>Year</th>
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<th>Founder and Chair</th>
<th>Date &amp; Place</th>
<th>Organized by</th>
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<tbody>
<tr>
<td>2005</td>
<td>4th DAAAM International Conference on Advanced Technologies for Developing Countries, ATDC-2005</td>
<td>Katalinic B.</td>
<td>September, 21-24th, 2005, Slavonski Brod, Croatia</td>
<td>Faculty of Mechanical Engineering, Josip Juraj Strossmayer University of Osijek; DAAAM International Vienna</td>
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<tr>
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<th>Founder and Chair</th>
<th>Date &amp; Place</th>
<th>Organized by</th>
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<tr>
<td>2006</td>
<td>5th DAAAM International Conference on Advanced Technologies for Developing Countries, ATDC-2006</td>
<td>Katalinic B.</td>
<td>28-30 June 2006, Rijeka, Croatia</td>
<td>University of Rijeka, Faculty of Engineering, DAAAM International Vienna</td>
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<tr>
<th>Year</th>
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17.0 DAAAM INTERNATIONAL CONFERENCES "ADVANCED TECHNOLOGIES FOR DEVELOPING COUNTRIES"

<table>
<thead>
<tr>
<th>Year</th>
<th>Conference Name</th>
<th>Founder and Chair</th>
<th>Date &amp; Place</th>
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<tbody>
<tr>
<td>2006</td>
<td>5th DAAAM International Conference on Advanced Technologies for Developing Countries, ATDC-2006</td>
<td>Katalinic B.</td>
<td>28-30 June 2006, Rijeka, Croatia</td>
<td>University of Rijeka, Faculty of Engineering, DAAAM International Vienna</td>
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<tr>
<th>Year</th>
<th>Conference Name</th>
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<tbody>
<tr>
<td>2005</td>
<td>4th DAAAM International Conference on Advanced Technologies for Developing Countries, ATDC-2005</td>
<td>Katalinic B.</td>
<td>September, 21-24th, 2005, Slavonski Brod, Croatia</td>
<td>Faculty of Mechanical Engineering, Josip Juraj Strossmayer University of Osijek; DAAAM International Vienna</td>
</tr>
<tr>
<td>Year</td>
<td>Conference Title</td>
<td>Date &amp; Place</td>
<td>Organizers</td>
<td>Proceedings</td>
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<tr>
<td>2003</td>
<td>2nd DAAAM International Conference on Advanced Technologies for Developing Countries, ATDC-2003</td>
<td>25-28th June 2003, Tuzla, Bosnia and Herzegovina</td>
<td>Faculty of Mechanical Engineering, University of Tuzla; DAAAM International Vienna</td>
<td>ISBN 3-901509-35-6</td>
</tr>
</tbody>
</table>
This workshop is based on the bilateral co-operation between two similar departments of the Faculties of Mechanical Engineering of the University of Zilina, Slovakia and Cracow University of Technology - CUT, Cracow, Poland. Those activities are supported by DAAAM National Organisations of Poland and Slovakia, and DAAAM International. In order to install this workshop as stable long-term regional platform for the CA Systems and Technologies fields it was decided to found:

Permanent Committee of Workshop:
Permanent Members:
I. Kuric (University of Zilina, Zilina, Slovakia),
B. Katalinic (Vienna University of Technology and DAAAM International, Vienna, Austria),
J. Duda (CUT, Cracow, Poland).

<table>
<thead>
<tr>
<th>Academic Year</th>
<th>Members</th>
<th>Institutions</th>
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<tr>
<td>2006/2007</td>
<td>B. Barisic</td>
<td>University of Rijeka, Croatia</td>
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<td></td>
<td>R. Cotetiu</td>
<td>University of Baia Mare, Romania</td>
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<td></td>
<td>L. Goldhahn</td>
<td>FH Mittweida, Germany</td>
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<td>J. Marcinčin</td>
<td>TU Kosice, Slovakia</td>
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<td>H. Sjolander</td>
<td>University of Kristianstad, Sweden</td>
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<td>P. Šugár</td>
<td>TU Zvolen, Slovakia</td>
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<td>N. Ungureanu</td>
<td>University of Baia Mare, Romania</td>
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<td>2005/2006</td>
<td>R. Cotetiu</td>
<td>University of Baia Mare, Romania</td>
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<td>J. Marcinčin</td>
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<td>J. Matuszek</td>
<td>University of Bielsko Biala, Poland</td>
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<td>S. Legutko</td>
<td>PUT Poznan, Poland</td>
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<td>TU Zvolen, Slovakia</td>
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<td>2004/2005</td>
<td>L. Goldhahn</td>
<td>FH Mittweida, Germany</td>
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<td></td>
<td>J. Madl</td>
<td>CVUT Prague, Czech Republic</td>
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<td>J. Marcinčin</td>
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<td>E. Pay</td>
<td>University of Baia Mare, Romania</td>
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<td>D. Plinta</td>
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<td>G. Varga</td>
<td>University of Miskolc, Hungary</td>
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<td>2003/2004</td>
<td>D. Georgiev</td>
<td>TU Varna, Bulgaria</td>
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<td>L. Goldhahn</td>
<td>FH Mittweida, Germany</td>
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<td>J. Manlig</td>
<td>TU Liberec, Czech Republic</td>
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<td>G. Varga</td>
<td>University of Miskolc, Hungary</td>
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<tr>
<td>2002/2003</td>
<td>D. Kunicakova</td>
<td>University of Zilina, Slovakia</td>
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<td>I. Neaga</td>
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<td>A. Pendrey</td>
<td>TU Birmingham, U.K.</td>
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<td>J. Peterka</td>
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<td>L. Soos</td>
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<tr>
<td>2001/2002</td>
<td>N. Cubonova</td>
<td>University of Zilina, Slovakia</td>
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<td>TU Kosice, Slovakia</td>
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<td></td>
<td>I. Neaga</td>
<td>TU Iasi, Romania</td>
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<td></td>
<td>J. Peterka</td>
<td>STU Trnava, Slovakia</td>
</tr>
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<td></td>
<td>L. Soos</td>
<td>STU Bratislava, Slovakia</td>
</tr>
<tr>
<td>1999/2000</td>
<td>S. Legutko</td>
<td>PUT Poznan, Poland</td>
</tr>
<tr>
<td></td>
<td>J. Marcinčin</td>
<td>TU Kosice, Slovakia</td>
</tr>
<tr>
<td></td>
<td>I. Neaga</td>
<td>TU Iasi, Romania</td>
</tr>
</tbody>
</table>
The main aim of the Permanent Committee is to prepare the DAAAM International workshops oriented on CA systems and technologies and propagate all accompanying activities during academic year (projects, WEB journal, common publications, PhD seminars, exchange of students and lectures, etc.). The list of workshops organised during the past.

<table>
<thead>
<tr>
<th>Year</th>
<th>Event Title</th>
<th>Date &amp; Place</th>
<th>Organized by</th>
<th>Organisers</th>
<th>Proceedings</th>
<th>Editors</th>
</tr>
</thead>
</table>
### 19.0 DAAAM INTERNATIONAL WORKSHOPS "INTELLIGENT MANUFACTURING SYSTEMS"

Founder and chair of DAAAM International workshop on Intelligent Manufacturing Systems is Professor Emil Wessely, Technical University of Kosice.

#### 2002

**4th DAAAM Workshop "Human Factor and Environmentalist"**

**Date & Place**
- 5th December 2002, Kosice, Slovakia

**Organized by**
- Department of Environmental Studies and Operations Management of Mechanical Engineering
- Faculty of Technical University of Kosice, DAAAM International Vienna

**Organized in cooperation with**
- Oesterreichische Sud-Ost Institut - Vienna
- Slovak Technical Museum of Kosice

**Organisers**

**Supported by**
- Action Austria - Slovakia

**Proceedings**
- ISBN 3-901509-31-3

**Editors**
- Katalinic B., Wessely E.

#### 2001

**3rd DAAAM Workshop "Intelligent Manufacturing Systems"**

**Date & Place**
- 29 November 2001, Kosice, Slovakia

**Organized by**
- Technical University of Kosice, DAAAM International Vienna, DAAAM Slovakia

**Organized in cooperation with**
- Action Austria-Slovakia, Faculty of Mechanical Engineering - Technical University of Kosice, Slovak Community for System Integration, Slovak Mechanical Engineering Association

**Organiser**
- Wessely E. (Chair), Badida M., Seminsky J., Evin E., Ljoljic B., Kordic V., Pecha C., Rovnak M., Taticek F.

**Supported by**
- Action Austria - Slovakia

**Proceedings**

**Editors**
- Katalinic B., Wessely E.

#### 2000

**2nd DAAAM Workshop "Intelligent Manufacturing Systems"**

**Date & Place**
- 30 November 2000, Kosice, Slovakia

**Organized by**
- Technical University of Kosice, DAAAM International Vienna, DAAAM Slovakia

**Organized in cooperation with**
- Action Austria-Slovakia, Faculty of Mechanical Engineering - Technical University of Kosice, Slovak Committee for Management - ZVTS Bratislava, Slovak Mechanical Engineering Association

**Organizer**
- Wessely E. (Chair), Seminsky J., Badida M., Evin E., Paralic J., Knoflicek R., Hradocky L., Bosak M., Kozak L., Vargova J.

**Supported by**
- Action Austria - Slovakia

**Proceedings**
- ISBN 3-901509-18-6

**Editors**
- Katalinic B., Wessely E.

#### 1997

**1st DAAAM Workshop "Intelligent Manufacturing Systems"**

**Date & Place**
- 28th November 1997, Kosice, Slovakia

**Organized by**
- Technical University of Kosice, DAAAM International Vienna, DAAAM Slovakia

**Organized in cooperation with**
- Action Austria-Slovakia, Faculty of Mechanical Engineering - Technical University of Kosice, Slovak Committee for Management - ZVTS Bratislava, Slovak Mechanical Engineering Association

**Organisers**
- Wessely E. (Chair), Seminsky J., Evin E., Kovacik J.

**Proceedings**
- ISBN 3-901509-09-7

**Editor**
- Seminsky J.[aroslav]
XXVI

20.0 DAAAM INTERNATIONAL WORKSHOPS

As an extension of the Symposia, International Workshops focussing on key issues are arranged. A number of these are detailed below.

<table>
<thead>
<tr>
<th>Year</th>
<th>Workshop Title</th>
<th>Date &amp; Place</th>
<th>Organized by</th>
<th>Proceedings</th>
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<tr>
<td>1994</td>
<td>2nd International DAAAM Workshop &quot;Integration of Applications“</td>
<td>15th May 1995, IBM Austria, Vienna, Austria</td>
<td>DAAAM International Vienna; IBM Österreich; IBM Central Europe and Russia; AKS</td>
<td></td>
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<tr>
<td>1991</td>
<td>1st International DAAAM Seminar “Concurrent Engineering”</td>
<td>17-18th April 1991, Kosice, Czechoslovakia</td>
<td>Schlumberger Technologies, CAD/CAM Division – Wien; Department for Automatic Production Systems, Faculty of Mechanical Engineering, Technical University of Kosice</td>
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</table>

21.0 INTERNATIONAL CONFERENCES ORGANIZED IN COOPERATION WITH DAAAM INTERNATIONAL AND/OR DAAAM NATIONAL

<table>
<thead>
<tr>
<th>Year</th>
<th>Conference Title</th>
<th>Date &amp; Place</th>
<th>Organized by</th>
<th>In cooperation with</th>
<th>Proceedings</th>
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<tbody>
<tr>
<td>2006</td>
<td>3rd International Textile Clothing &amp; Design Conference, ITC&amp;DC 2006</td>
<td>8-11th October 2006, Dubrovnik, Croatia</td>
<td>Faculty of Textile Technology, University of Zagreb</td>
<td>Croatian Ministry of Science, Education and Sport; University of Zagreb; Croatian Ministry of Economy, Labour and Entrepreneurship; Croatian Chamber of Economy</td>
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<tr>
<td>2006</td>
<td>11th International FMTÜ Conference for Young Researchers: Focus on IMS and Environmentally friendly technologies</td>
<td>24-25 March 2006, Cluj -Napoca, Romania</td>
<td>Technical Section of Transylvanian Museum Society (EME)</td>
<td>DAAAM International Vienna</td>
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<tr>
<td>Year</td>
<td>Event</td>
<td>Date &amp; Place</td>
<td>Organized by</td>
<td>Under Auspices of</td>
<td>Proceedings ISBN</td>
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<td>2006</td>
<td>5th International Conference of DAAAM Baltic &quot;Industrial Engineering – Adding Innovation Capacity of Labour Force and Entrepreneur&quot;</td>
<td>20-22nd April 2006, Tallinn Technical University, Estonia</td>
<td>Tallinn University of Technology, Faculty of Mechanical Engineering, DAAAM Estonia</td>
<td>DAAAM International Vienna</td>
<td>9985-894-92-8</td>
</tr>
<tr>
<td>2004</td>
<td>The 5th International Workshop on Emergent Synthesis</td>
<td>May 24-25, 2004, Budapest, Hungary</td>
<td>Computer and Automation Research Institute, Hungarian Academy of Sciences</td>
<td>L. Monostori, B. Katalinic, K. Ueda</td>
<td></td>
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<tr>
<td>2004</td>
<td>4th International DAAAM Conference &quot;Industrial Engineering – Innovations as Competitive Edge for &quot;</td>
<td>29-30th April 2004, Tallinn Technical University, Estonia</td>
<td>Tallinn Technical University - Department of Machinery, DAAAM Estonia, DAAAM International Vienna</td>
<td>Baltic Rector's Council; Association of Estonian; Mechanical Engineers, Federation of Estonian Engineering Industries</td>
<td>9985-894-59-6</td>
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<tr>
<td>2003</td>
<td>The 1st European-Pacific Congress Globalization: Interaction of Economies, Cultures, Technologies, and Nature,</td>
<td>23-26th September, 2003, Vladivostok, Russia</td>
<td>Association &quot;International Assembly of Capitals and Cities&quot;; DAAAM International Vienna; Far Eastern State Technical University; Far Eastern National University; Maritime State University; International Engineering Academy Primorsk Chamber of Commerce &amp; Industry; Far Eastern Branch of the Russian Academy of Sciences; Russian PEN Center; Vladivostok City Administration; Vladivostok Program Committee; Vladivostok State University of Economics</td>
<td>Yu.M. Kopylov (Chairman); (Co-Chairman); G.S. Vishnyakova (Co-Chairman); I.V. Abroskin (Co-Chairman); Branko Katalinic (Co-Chairman); M.M. Sokolov, (Co-Chairman); A.A. Akhonin (Coordinator); R.G. Kazmiruk (Secretary)</td>
<td>in Print</td>
</tr>
<tr>
<td>2003</td>
<td>The 8th Scientific Conference of Young Technical Researches, FMTU-2003</td>
<td>21-22nd March 2003, Cluj-Napoca</td>
<td>Technical Section of The Transilvanian Museum Association</td>
<td>President of Scientific Committee: Professor Dr Csaba Gyenge</td>
<td>953-96408-8-1</td>
</tr>
<tr>
<td>2002</td>
<td>1st International Textile Clothing &amp; Design Conference, ITC&amp;DC</td>
<td>6-9th October 2002, Dubrovnik, Croatia</td>
<td>Faculty of Textile Technology, University of Zagreb</td>
<td>DAAAM International Vienna; Association of Universities for Textile, Ghent, Belgium; The Textile Institute, Manchester, Great Britan; International Textile Academia; University of Zagreb; Croatian Academy of Engineering</td>
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<tr>
<td>Year</td>
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<td>2002</td>
<td>8th International Conference on Soft Computing: MENDEL 2002</td>
<td>5-7th June 2001, Brno, Czech Republic</td>
<td>Brno University of Technology, Faculty of Mechanical Engineering, Institute of Automation and Computer Science; DAAAM International Vienna, Austria; Foundation for Advanced Information Technology GENOPS, Ltd</td>
<td>Ošmera P., Šeda M., Dvořák J., Roupec J., Matousek R.</td>
<td></td>
</tr>
<tr>
<td>2001</td>
<td>7th International Conference on Soft Computing: MENDEL 2001: Evolutionary Computation, Genetic Programming, Fuzzy Logic, Rough Sets, Neural Networks, Fractals, Bayesian Methods</td>
<td>6–8th June 2001, Brno, Czech Republic</td>
<td>Brno University of Technology, Faculty of Mechanical Engineering, Institute of Automation and Computer Science; DAAAM International Vienna, Austria; Foundation for Advanced Information Technology GENOPS, Ltd</td>
<td>Ošmera P., Šeda M., Dvořák J., Roupec J., Matousek R.</td>
<td></td>
</tr>
<tr>
<td>2001</td>
<td>2nd International Conference Business Systems Management UPS 2001</td>
<td>31st May - 2nd June 2001, Mostar, Bosnia and Herzegovina</td>
<td>University of Mostar Faculty of Mechanical Engineering, DAAAM International Vienna, Austrian Society of Engineers and Architects OEIAV-1848</td>
<td>Majstorovic V. (Chair), Katalinic B. (Chair), Covic D., Visekruna, V.</td>
<td></td>
</tr>
<tr>
<td>2000</td>
<td>5th International Conference on Soft Computing: MENDEL 2000: Evolutionary Computation, Genetic Programming, Fuzzy Logic, Rough Sets, Neural Networks, Fractals, Bayesian Methods</td>
<td>7-9th June 2000, Brno, Czech Republic</td>
<td>Brno University of Technology, Faculty of Mechanical Engineering, Institute of Automation and Computer Science; DAAAM International, Vienna, Austria; Foundation for Advanced Information Technology GENOPS, Ltd</td>
<td>Ošmera P., Šeda M., Dvořák J.</td>
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<tr>
<td>2000</td>
<td>2nd International Conference on Industrial Engineering – Activities Targeted to SME</td>
<td>27 - 29th April 2000, Tallinn Technical University, Estonia</td>
<td>Tallinn Technical University - Department of Machinery, DAAAM Estonia, DAAAM</td>
<td>Tallinn Technical University, Estonia, DAAAM Estonia, DAAAM</td>
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<tr>
<td><strong>District Heating Control ´99 – Control of Extensive Heating Systems</strong></td>
<td>26-27th October 1999, Zlin, Czech Republic</td>
<td>Brno University of Technology, Faculty of Technology in Zlin; Czech Power Plants – Ltd.; Association for District Heating of Czech Republic; EUROHEAT &amp; Power, Unichal – Brussels; DAAAM International, Vienna, Austria; DAAAM - Czech Republic</td>
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<tr>
<td><strong>5th International Conference on Soft Computing: MENDEL ´99:</strong></td>
<td>9-12th June 1999, Brno, Czech Republic</td>
<td>Technical University Brno, Faculty of Mechanical Engineering, Institute of Automation and Computer Science; DAAAM International, Vienna, Austria; Foundation for Advanced Information Technology GENOPS, Ltd</td>
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<tr>
<td><strong>5th International Conference Maintenance 99</strong></td>
<td>7-8th June 1999, Opatija, Croatia</td>
<td>Croatian Maintenance Society</td>
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<tr>
<td><strong>XXIVth Seminary ASR 2000: Instruments and Control</strong></td>
<td>28th April 1999, Ostrava, Czech Republic</td>
<td>VŠB - Technical University Ostrava, Faculty of Mechanical Engineering, Institute of Automation Equipment and Control; DAAAM National - Czech Republic, Zlin, Czech Republic; IMECO - Czech National Committee; Committee of Applied Cybernetics and Information Technology Ostrava</td>
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<tr>
<td><strong>XXIIth Seminary ASR ´99 : Computers on Measurements, Diagnostics and Control</strong></td>
<td>22nd May 1999, Ostrava, Czech Republic</td>
<td>VŠB - Technical University Ostrava, Faculty of Mechanical Engineering, Institute of Automation Equipment and Control; DAAAM National - Czech Republic, Zlin, Czech Republic; IMECO - Czech National Committee</td>
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<tr>
<td><strong>3rd International Conference „ New Trends in Automation of Energetic Processes ´98“</strong></td>
<td>19 - 20th May 1998, Brno, Czech Republic</td>
<td>Technical University Brno, Faculty of Technology in Zlin; Czech Power Company, Ltd.-CEZ, a.s.; Association for District Heating, Czech Republic; STU Bratislava, Faculty of Electrical Engineering and Information Technology; Slovak Power Plants, Ltd. - SE, a.s., Bratislava; DAAAM International Vienna, Austria; DAAAM National - Czech Republic</td>
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<tr>
<td><strong>International Mendel Conference: MENDEL ´98</strong></td>
<td>24 - 26th June 1998, Brno, Czech Republic</td>
<td>Technical University Brno, Faculty of Mechanical Engineering, Institute of Automation and Information Technology; DAAAM International, Vienna, Austria; Foundation for Advanced Information Technology GENOPS, Ltd.</td>
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</table>

**Under the auspices of**
DAAAM International Vienna

**In cooperation with**
Baltic Rector's Council; Association of Estonian; Mechanical Engineers, Federation of Estonian Engineering Industries

**Organizers**
Kyttner R. (chair) Katalinic B., Kulu P., Papstel J., Reedik V., Riives J.

**Proceedings**
ISBN 9985-894-21-9

**Editors**
J. Papstel / Katalinic B.
| Year | Conference Title                                                                 | Date & Place                                                                 | Organized by                                                                                                                                                                                                 | Organizer(s)                                                                                      | ISBN/ISSN/Publication Details                                                                 |
|------|----------------------------------------------------------------------------------|-------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|
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DAAAM INTERNATIONAL VIENNA 2007

Organizer: Papstel J. & Co

Editor: Papstel J.

1996

Date & Place: 2nd International Mendel Conference on Genetic Algorithms MENDEL '96
26-28th June 1996, Brno, Czech Republic
Organisation: Technical University of Brno, Faculty of Mechanical Engineering, Institute of Automation and Computer Science; DAAAM Czech Republic & DAAAM International Vienna; Foundation Advanced Information Technology; AutoCont Brno Ltd. Computer Systems
Organizer: Osmera P. & Co.

1996

Date & Place: 13th Conference BIAM '96
18-20th June 1996, Zagreb, Croatia
Organisation: KoREMA, Croatian Society for Communications, Computing, Electronics, Measurement and Control, DAAAM International Vienna

1996

Date & Place: Nanotechnologie - Nanometrologie
26th April 1996, Brno, Czech Republic
Organisation: Technical University of Brno, Faculty of Mechanical Engineering, Vienna University of Technology; DAAAM Czech Republic
Organizer: P. H.Osanna, J. Svejcar, J. Vackar, M. Skopal

22.0 DAAAM & CEEPUS JEP

A-104 CEEPUS Joint European Project "Intelligent Manufacturing and Automation"
Network Co-ordinator: Branko Katalinic - Vienna University of Technology

Project Code: A-104
Project Duration: 1999-2004
Project Coordinator: Branko Katalinic - Vienna University of Technology

2003/2004 Name: Intelligent Manufacturing and Automation
Project Partner 03/04: Institute of Production Engineering, Vienna University of Technology, Vienna, Austria / Department of Manufacturing Engineering, Budapest University of Technology and Economics, Budapest, Hungary / Department of Manufacturing Engineering, Technical University of Cluj-Napoca, Cluj-Napoca, Romania / Department of Technology, Faculty of Mechanical Engineering and Naval Architecture, University of Zagreb, Zagreb, Croatia / Department of Technological Devices and Systems, Faculty of Material Science and Technology Trnava, Slovak University of Technology Bratislava, Trnava, Slovakia / Institute of Production Engineering, University of Maribor, Maribor, Slovenia / Department of Environmental Studies and Process Control, Technical University of Kosice, Kosice, Slovakia / Department of Machine Technology, The Silesian University of Technology, Gliwice, Poland / Department of Production Engineering, Faculty of Engineering, University of Rijeka, Rijeka, Croatia / Institute of Mechanical Technology, Poznan University of Technology, Poznan, Poland

Organizer 03/04: Katalinic B.[ranko], Alpek F.[erenc], Balic J.[oze], Gyenge C.[saba], Kosmol J.[an], Legutko S.[tanislaw], Mikac T.[onci], Velisek K.[arol], Wessely E.[mil], Udiljak T.[oma]

2002/2003 Name: Intelligent Manufacturing and Automation
Project Partner 02/03: Institute of Production Engineering, Vienna University of Technology, Vienna, Austria / Department of Manufacturing Engineering, Budapest University of Technology and Economics, Budapest, Hungary / Department of Manufacturing Engineering, Technical
<table>
<thead>
<tr>
<th>Year</th>
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<th>Organizer</th>
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<tr>
<td>1999/2000</td>
<td>RO-01</td>
<td>Assembly Automation in Manufacturing Engineering</td>
<td>Vienna University of Technology, Slovak Technical University Bratislava / Trnava, Technical University Cluj-Napoca, Technical University of Kosice, University of Maribor, University of Zagreb</td>
<td>Katalinic B., Velisek K., Gyenge C., Alpek F., Wessely E., Balic J., Jerbic B.,</td>
</tr>
<tr>
<td>2001/2002</td>
<td>RO-02</td>
<td>Assembly Automation in Manufacturing Engineering</td>
<td>Vienna University of Technology, Budapest University of Technology and Economics, Silesian University of Technology, Technical University of Kosice, University of Maribor, University of Zagreb</td>
<td>Katalinic B., Alpek F., Kosmol J., Velisek K., Gyenge C., Wessely E., Balic J., Jerbic B.,</td>
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<tr>
<td>Geometrical Surface Structure of Machine Parts, Constitution, Methods for Measurement and Assessment, Influence on the Operational Capacity of Mating Machine Parts</td>
<td>Technical University of Kielce, Vienna University of Technology, University of Zilina, Technical University of Kosice, University of Maribor, Technical University of Ostrava, University of Zagreb, Technical University of Bratislava, Technical University of Prague, Technical University of Brno</td>
<td>Adamczak S., Osanna P. H., Obmascik M., Wessely E., Cus F., Vrba V., Mahovic S., Janac J., Dvorak R., Vackar J.</td>
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<tr>
<td>Project Coordinator:</td>
<td>Csaba Gyenge, Technical University of Cluj-Napoca</td>
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<tr>
<th>1998/1999 Name</th>
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<tr>
<td>Development and Application of Environment-Friendly Technologies in Manufacturing Engineering</td>
<td>Technical University of Cluj-Napoca, Technical University of Budapest, University of Maribor, Technical University of Kosice, Technical University of Bucharest</td>
<td>Gyenge C., Alpek F., Balic J., Anna V., Iatan F.</td>
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<td>Project Coordinator:</td>
<td>Stanislaw Adamczak - Technical University of Kielce</td>
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<tr>
<th>1998/1999 Name</th>
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<th>Organizer</th>
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<tr>
<td>Metrology in Quality Assurance Systems</td>
<td>Technical University of Kielce, Vienna University of Technology, University of Zilina, Technical University of Kosice, University of Maribor, Technical University of Ostrava, University of Zagreb</td>
<td>Adamczak S., Osanna P. H., Obmascik M., Wessely E., Cus F., Vrba V., Mahovic S.</td>
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<td>Project Duration:</td>
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<td>Project Coordinator:</td>
<td>Alpek,F.</td>
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<tr>
<th>1998/1999 Name</th>
<th>Project Partner</th>
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<tbody>
<tr>
<td>Process Integrated Measurement Techniques and Methods for Quality Management</td>
<td>Technical University of Budapest, Vienna University of Technology, Cracow Institute of Technology, Slovak Technical University Bratislava, University of Maribor</td>
<td>Alpek F., Osanna H. P., Sostar A., Gawlik J., Kralik,M.</td>
</tr>
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</table>

## 23.0 DAAAM INTERNATIONAL BOOKS

The DAAAM International initiated publishing of books in the field of advanced manufacturing and automation. There are three series: "Manufacturing technology", "DAAAM International University Book" and “Management Sciences”. Till now the following books are published:

**DAAAM Publishing series - Manufacturing technology:**


**DAAAM Publishing series - University Book:**


DAAAM Publishing Series – Management Science:


DAAAM International Scientific Book


Book published under the auspices of DAAAM International


Several other book projects are in process, if you want to join one of them or propose to write a new book please contact the Editor.
24.0 INTERNATIONAL JOURNAL OF SIMULATION MODELLING

<table>
<thead>
<tr>
<th>Title</th>
<th>International Journal of Simulation Modelling</th>
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<tbody>
<tr>
<td>Abbreviated key title</td>
<td>IJSIMM Int. j. simul. model.</td>
</tr>
<tr>
<td>ISSN</td>
<td>ISSN 1726-4529</td>
</tr>
<tr>
<td>Editors</td>
<td>B.[orut] Buchmeister (Editor-In-Chief); B.[ranko] Katalinic (Editor)</td>
</tr>
<tr>
<td>Founded</td>
<td>2002</td>
</tr>
<tr>
<td>Published</td>
<td>Quarterly by DAAAM International Vienna</td>
</tr>
<tr>
<td>Citation and reference</td>
<td>Article published in Journal are crossreferenced and online available on Internet. Additionally, they are cited and referenced in the: Inspec Database and Cambridge Scientific Abstracts</td>
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</tbody>
</table>

25.0 20 YEARS DAAAM INTERNATIONAL 1990-2010 PROJECT

Aims: The main aims for future development of our organisation are to increase meaning, importance, quality, relevance and prestige of DAAAM International Network and members in international academic and scientific community. To achieve these aims it is necessary to improve quality and quantity of existing activities and to organize new creative future oriented activities using enormous potential of knowledge, abilities, prestige, relevance and creativity of our members.

Who: Each person in DAAAM International community is welcome to give his/her own contribution to achieving defined aims and can be responsible for one initiative or activity on the level of DAAAM International.

Focus: Focused on upper aims and the fact that we are going soon to celebrate first 20 years of our organisation we are starting an open platform under the name "20 Years of DAAAM International Project". The project is open platform the main parts and topics of the project are:

• To complete and publish Cumulative Bibliography of DAAAM International including all publications: proceedings of DAAAM Symposiums; proceedings of DAAAM Workshops; proceedings of ATDC conferences; DAAAM International Scientific Books; International Journal on Simulation Modelling; Books.
• Founding and organisation of web DAAAM International Archive
• Founding and organisation of web DAAAM International Photo Gallery
• Completing and publishing exclusive monograph "20 Years of DAAAM International"
• Founding, completing and publishing "Who is who in DAAAM International" (Founding members, members of committees since 1990, authors, honours, awards, personal contributions, …)
• improve quality and quantity of existing activities of DAAAM
• to motivate old and animate new people to take a part in our activities
• better use of human resources
• including of younger researchers in our activities
• sponsoring and partnerships
• to increase dissemination of information about our activities
• use of synergies of DAAAM Network in science, research, education and international scientific and academic cooperation
• awards and recognition for DAAAM International on the occasion of celebrating of anniversary of your institution
• to increase quality of our publications
• increase citing and indexing of our publications
• publishing of journals, monographs and student books
• international scientific and academic cooperation with joint application for co-operation of institutions and mobility of teachers and students
• cooperation in industrial and research projects
• DAAAM International certifications of Labs
• Marketing
• DAAAM International Experts data bank
• Cyber space and DAAAM
• Spectrum of Activities to celebrate 20 Years of DAAAM International in 2009
• and many of your ideas
Call for cooperation: Please think about your wishes, possibilities, and field of interest and propose me one to three initiatives you or your team want to start, organize, manage and be responsible in the frame of DAAAM International. I will pick out of your proposal one initiative which is at the moment the most important from the point of view of DAAAM International. I will give you additional information and suggestions to support your initiative and make it relevant and usable for DAAAM International and synchronised with other activities.

Contact: I am looking forward to see soon your ideas, creativity and initiatives. Please be free to contact me at president@daaam.com I will be happy to hear from you.

26.0 DAAAM - INTERNET & CONTACT ADDRESS

Additional information about DAAAM activities you can obtain from DAAAM homepage: http://www.daaam.com and http://www.daaam.org If you are interested to take a part in DAAAM activities please contact:

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