

Conference Program at a Glance

Main Conference Schedule

| | | | |
|--------------------------------------|-------------------------------------|--------------------------------------|--|
| September 23, 2021 (Thursday) | | 16 ⁰⁰ ÷17 ¹⁵ | Presentation time – part 2 |
| 8 ⁰⁰ ÷10 ⁰⁰ | Registration of participants | 17 ¹⁵ ÷17 ³⁰ | Coffe break |
| 10 ⁰⁰ ÷10 ³⁰ | Conference Opening Ceremony | 17 ³⁰ ÷18 ³⁰ | Presentation time – part 3 |
| 10 ³⁰ ÷11 ⁰⁰ | Coffe break | 19 ⁰⁰ | Conference Gala dinner |
| 11 ⁰⁰ ÷13 ⁰⁰ | Plenary session | September 24, 2021 (Friday) | |
| 13 ⁰⁰ ÷14 ⁰⁰ | Snack lunch and free time | 9 ⁰⁰ ÷10 ³⁰ | Final plenary session and round table |
| 14 ⁰⁰ ÷14 ³⁰ | Sponsors presentation time | 10 ³⁰ ÷11 ⁰⁰ | Coffe break |
| 14 ³⁰ ÷15 ⁴⁵ | Presentation time – part 1 | 11 ⁰⁰ ÷16 ⁰⁰ | Conference sightseeing tour |
| 15 ⁴⁵ ÷16 ⁰⁰ | Coffe break | September 25, 2021 (Saturday) | |
| | | 9 ⁰⁰ ÷10 ³⁰ | Tour of the laboratories |

| Time | Day: 1 Thursday, September 23, 2021 | | | |
|--|---|--|--|----------------------------------|
| | H A L L | | | |
| | UNIVERSITY OF NOVI SAD, RECTORATE BUILDING <i>Dr Zorana Đinđića 1, Novi Sad</i> | | | |
| | Hall I (Main auditorium / Amphitheatre) | Hall II (1 st floor, Room I-16) | Hall III (2 nd floor, Room II-13) | Hall IV (Ground floor) |
| 8 ⁰⁰ ÷ 10 ⁰⁰ | REGISTRATION OF PARTICIPANTS (University entrance hall) | | | |
| 10 ⁰⁰ ÷ 10 ³⁰ | CONFERENCE OPENING CEREMONY (Hall I - onsite) | | | |
| 10 ³⁰ ÷ 11 ⁰⁰ | Coffe break (University restaurant and entrance hall) | | | |
| 11 ⁰⁰ ÷ 13 ⁰⁰ | PLENARY SESSION (hybrid - onsite in Hall I and online) | | | |
| 13 ⁰⁰ ÷ 14 ⁰⁰ | Snack lunch and free time (University restaurant) | | | |
| 14 ⁰⁰ ÷ 14 ³⁰ | Sponsors presentation time (hybrid - onsite in Hall IV and online) | | | |
| PRESENTATION TIME – PART 1 (hybrid - onsite and online) | | | | |
| 14 ³⁰ ÷ 15 ⁴⁵ | Section: A (Hall II) | | Section: B (Hall III) | Section: C (Hall IV) |
| 15 ⁴⁵ ÷ 16 ⁰⁰ | Coffe break (University restaurant) | | | |
| PRESENTATION TIME – PART 2 (hybrid - onsite and online) | | | | |
| 16 ⁰⁰ ÷ 17 ¹⁵ | Section: D (Hall II) | | Section: E (Hall III) | |
| 17 ¹⁵ ÷ 17 ³⁰ | Coffe break (University restaurant) | | | |
| PRESENTATION TIME – PART 3 (hybrid - onsite and online) | | | | |
| 17 ³⁰ ÷ 18 ³⁰ | Section: G (Hall II) | | Section: F (Hall III) | |
| 19 ⁰⁰ | CONFERENCE GALA DINNER – RESTAURANT ALASKA BARKA <i>Ribarsko ostrvo 4, Novi Sad</i> | | | |
| Time | Day: 2 Friday, September 24, 2021 | | | |
| 9 ⁰⁰ ÷ 10 ³⁰ | FINAL PLENARY SESSION AND ROUND TABLE (Hall DPE) | | | |
| 10 ³⁰ ÷ 11 ⁰⁰ | Coffe break | | | |
| 11 ⁰⁰ ÷ 16 ⁰⁰ | EXCURSION TO PETROVARADIN FORTRESS AND SREMSKI KARLOVCI | | | |
| Time | Day: 3 Saturday, September 25, 2021 | | | |
| 9 ⁰⁰ ÷ 10 ³⁰ | TOUR OF THE LABORATORIES AT THE DEPARTMENT OF PRODUCTION ENGINEERING | | | |

MMA2021

FLEXIBLE TECHNOLOGIES

14TH INTERNATIONAL SCIENTIFIC CONFERENCE
NOVI SAD, SERBIA, SEPTEMBER 23-25, 2021.

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About the Conference

Continuing a long tradition of more than 40 years, the Department of Production Engineering of the Faculty of Technical Sciences and its Chairs:

- **Chair for machining,**
- **Chair of machine tools, process planning, flexible manufacturing systems and design processes,**
- **Chair of metrology, quality, fixtures, tools and environmental-engineering aspects,** organize an international scientific-expert conference, called:

14th International Scientific Conference MMA 2021 - FLEXIBLE TECHNOLOGIES

The conference will cover current issues in the field of production engineering as well as multidisciplinary fields of mechanical engineering, information technologies, environmental engineering, biomedical engineering and other related engineering fields. The scientific-expert conference MMA, with its long tradition and regular organization since 1976, aims to gather and exchange experience of researchers and experts from faculties, institutes and industry, and thus wants to contribute to more intensive scientific and economic development.

Department of Production Engineering is the department with the longest tradition at the Faculty of Technical Sciences since its inception in 1976. At the Department of Production Engineering more than 1300 students have graduated and about 40 students have obtained a doctoral degree. There are currently around 300 students studying at the Department. Department of Production Engineering issues international journals: "*Journal of Advanced Technologies and Materials*" and "*Journal of Production Engineering*".

Faculty of Technical Sciences is one of the most modern organized higher education institutions in the region with a long tradition, and engineers educated at this Faculty, work and achieve remarkable results in companies that are connected with technology, production, education or services. The Faculty was founded 1960 as a Faculty of Mechanical Engineering. Today, the faculty consists of 13 departments that educate engineers, graduate engineers, master engineers, specialists and doctors of science.

MMA Conference history

| No. | Year | Location | Chair of Scientific Committee | Chair of Organizing Committee |
|-----|------|---|-------------------------------|-------------------------------|
| 1. | 1976 | Faculty of Technical Sciences, Novi Sad | | Sava Sekulić |
| 2. | 1979 | Faculty of Technical Sciences, Novi Sad | | Dragan Banjac |
| 3. | 1983 | Faculty of Philosophy, Novi Sad | | Jožef Rekecki |
| 4. | 1990 | SPENS, Novi Sad | Jožef Rekecki | Ratko Gatalo |
| 5. | 1994 | Novi Sad FAIR, Novi Sad | Ratko Gatalo | Velimir Todić |
| 6. | 1997 | Hotel Sloboda, Sombor | Ratko Gatalo | Dragoje Milikić |
| 7. | 2000 | Faculty of Technical Sciences, Novi Sad | Ratko Gatalo | Janko Hodolič |
| 8. | 2003 | Faculty of Technical Sciences, Novi Sad | Ratko Gatalo | Ljubomir Borojev |
| 9. | 2006 | Faculty of Technical Sciences, Novi Sad | Dragoje Milikić | Velimir Todić |
| 10. | 2009 | Faculty of Technical Sciences, Novi Sad | Velimir Todić | Pavel Kovač |
| 11. | 2012 | Faculty of Technical Sciences, Novi Sad | Janko Hodolič | Miodrag Hadžistević |
| 12. | 2015 | Hotel Ceptor, Andrevlje | Milan Zeljković | Slobodan Tabaković |
| 13. | 2018 | Rectorate Building, Novi Sad | Mijodrag Milošević | Dejan Lukić |

Introduction to Conference Committees

INTERNATIONAL SCIENTIFIC COMMITTEE

Milenko Sekulić, *Chairman, University of Novi Sad, SRB*
Bojan Ačko, *University of Maribor, SVN*
Boris Agarski, *University of Novi Sad, SRB*
Sergei Alexandrov, *Russian Academy of Sciences, RUS*
Aco Antić, *University of Novi Sad, SRB*
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Erhan Budak, *Sabancı University, TUR*
Igor Budak, *University of Novi Sad, SRB*
Emanuele Carpanzano, *Un. of App. Sci. and Arts of S. Switz., CHE*
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Kornel Ehmman, *Northwestern University, USA*
Sabahudin Ekinović, *University of Zenica, BIH*
Luigi Maria Galantucci, *Politecnico di Bari, ITA*
Adam Gaska, *Cracow University of Technology, POL*
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Gordana Globočki Lakić, *University of Banja Luka, BIH*
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Miodrag Hadžistević, *University of Novi Sad, SRB*
František Holešovský, *Tomas Bata University, CZE*
Predrag Janković, *University of Niš, SRB*
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Mikolaj Kuzinovski, *Ss. Cyril and Methodius U., MKD*
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Dragan Rajnović, *University of Novi Sad, SRB*
Biserka Runje, *University of Zagreb, CRO*
Borislav Savković, *University of Novi Sad, SRB*
Antun Stoić, *University of Osijek, CRO*
Tibor Szalay, *Budapest U. of Technology and Eco., HUN*
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Mladen Šercer, *University of Zagreb, CRO*
Leposava Šiđanin, *University of Novi Sad, SRB*
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HONORARY COMMITTEE

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Vid Jovišević, *University of Banja Luka, BIH*
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Mirko Soković, *University of Ljubljana, SLO*
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Velimir Todić, *University of Novi Sad, SRB*
Dragiša Vilotić, *University of Novi Sad, SRB*

Introduction to Conference Committees

ORGANIZING COMMITTEE

Borislav Savković, University of Novi Sad, SRB, chairman

Anđelko Aleksić, University of Novi Sad, SRB

Dragan Rodić, University of Novi Sad, SRB

Miroslav Dramićanin, University of Novi Sad, SRB

Miloš Knežev, University of Novi Sad, SRB

Zorana Lanc, University of Novi Sad, SRB

Ivan Matin, University of Novi Sad, SRB

Cvijetin Mladenović, University of Novi Sad, SRB

Nenad Kulundžić, University of Novi Sad, SRB, secretary

Miloš Ranisavljev, University of Novi Sad, SRB

Željko Santoši, University of Novi Sad, SRB

Milana Ilić Mićunović, University of Novi Sad, SRB

Mario Šokac, University of Novi Sad, SRB

Branko Štrbac, University of Novi Sad, SRB

Marko Zagoričnik, University of Novi Sad, SRB

Conference Topics

MATERIAL REMOVAL TECHNOLOGIES

- Cutting Technology – improvement and application of existing cutting processes; progressive, advanced, precision and environmentally friendly processes;
- Fundamentals of cutting process – machinability, cutting characteristics, database of machining, intelligent machining processes;
- Monitoring, modelling and optimization of machining processes – development of the procedures and their practical implementation;
- Non-conventional and hybrid technologies – research and application in contemporary industry;

MACHINE TOOLS AND AUTOMATIC FLEXIBLE TECHNOLOGICAL SYSTEMS, CAx AND CIM PROCEDURES AND SYSTEMS

- Development and prediction of trends in development of machine tools and complex manufacturing systems;
- New concepts of machine tools;
- Development of machine tool and manufacturing system components; development of control, drive, measuring and manipulation systems;
- Machine tool design; new methods in design and construction;
- Behavior testing of machine tools and components; modern methods and results;
- Exploitation, modernization and maintenance of machine tools as means to an increased productivity and cost efficiency; methods, procedures and solutions;
- Automatic flexible technological structures; conceptual solutions, developed solutions, exploitation characteristics;
- Procedures and systems for automated designing, construction and calculation - product design;
- Procedures and systems for automated programming of NC machine tools, manipulation systems, measurement machines and complex technological systems;
- Complex technological systems, Systems for computer integrated manufacturing; conceptual solutions, achievements in development;
- Techno-economical aspects of practice of CAD, CAM, CAQ, ..., CIM systems;
- New approaches and methods in designing and production (systems of artificial intelligence, expert systems, mechatronics, concurrent engineering, reverse engineering, rapid prototyping, virtual prototype, ...);

METROLOGY, QUALITY, FIXTURES, CUTTING TOOLS AND TRIBOLOGY

- Legal metrology, standardization;
- Measurement and instrumentation, measurement methods, measurement techniques;
- Precision engineering, calibration, CAQ/CAI;
- 3D-Digitization, reverse engineering, CAD Inspection;
- Quality tools, quality control;
- Total quality management, six sigma, manufacturing management;
- Maintenance, maintenance systems, maintenance management;
- Technical diagnostics, diagnostics methods, diagnostics techniques;
- Fixtures layout optimization, fixtures design, fixtures analysis;
- Flexible fixture systems, fixtures management;
- Cutting tool materials, cutting tool design;
- Modular tooling, cutting tool management;
- Surface topography, friction, wear, lubricants, coatings;
- Triboanalysis, tribomonitoring, tribometry, biotribology;

Conference Topics

PROCESS PLANNING, OPTIMIZATION, LOGISTICS AND INTERNET TECHNOLOGIES IN PRODUCTION ENGINEERING

- Processes planning; Group technology; Integrated CAPP systems;
- Technoeconomical optimization; Optimization methods; Multi-criteria decision-making;
- Design for manufacturing and assembly-DfMA; Product manufacturability; Production cost and time;
- Production logistics; Production planning, scheduling and control; Modeling, simulation and optimization of manufacturing and production processes;
- Collaborative engineering; Cloud manufacturing; Smart manufacturing;
- Manufacturing cyber physical systems; Internet of things in manufacturing;

MATERIALS, METAL FORMING, CASTING AND WELDING

- Metal forming technologies;
- Casting technologies;
- Welding technologies;
- Heat treatment technologies, nanotechnologies and surface engineering technologies;
- Plastics shaping technologies;
- Materials in production engineering;

MECHANICAL ENGINEERING AND ENVIRONMENTAL PROTECTION

- Cleaner production;
- Recycling, zero waste technologies;
- Environmental management;
- Eco-design and Life Cycle Assessment (LCA) of products and processes;

BIO-MEDICAL ENGINEERING

- Application of modern engineering methods in development of biomedical products (3D digitization, reverse engineering, rapid prototyping, virtual design, ...)
- Application of modern manufacturing technologies in production of biomedical products (CAD/CAM, rapid prototyping, rapid tooling, ...);
- Modern approaches in quality control of biomedical products;

ADDITIVE MANUFACTURING TECHNOLOGIES

- Reliability, quality, and performance of the AM processes and the main challenges for their commercialization and utilization in advanced applications.

Keynote Speakers

Prof. Dr. ERHAN BUDAK

Sabanci University, Turkey (CIRP Fellow)

Dr. Budak has been working on various aspects of machining processes and machine tools for 3 decades. After receiving B.Sc. (1987) and M.Sc. (1989) from the Middle East Technical University, he completed his Ph.D. (1994) at the University of British Columbia in Manufacturing Automation Lab. He then worked for Pratt & Whitney Canada as manufacturing development engineer until 2000 focusing on turbine engine manufacturing. Dr. Budak joined Sabanci University as a faculty member in 2000 and founded Manufacturing Research Lab (<http://labs.sabanciuniv.edu/mrl/>). In 2003, he was awarded the Taylor Medal by CIRP (www.cirp.net) for his work on high performance machining of turbine engine impellers and blisks. He was recipient of Mustafa Parlar “Science Award” (2018) based on his contributions to the machining research. He is the founder of a spin-off company, Maxima Manufacturing R&D, which develops and implements machining solutions for various industries. He has authored/co-authored more than 200 articles and papers in conference proceedings receiving more than 10 000 citations with h-index of 50 (Google Scholar). He is a fellow of CIRP (currently Chair of Scientific Committee on Machines), associate/regional editor and editorial board member of several journals. His areas of interest include machining processes and machine tools, intelligent manufacturing, process modelling and simulation, high precision/ performance manufacturing and machine dynamics.



Prof. Dr. EMANUELE CARPANZANO

University of Applied Sciences and Arts of Southern Switzerland, Switzerland, (CIRP Fellow)



Prof. Dr. Emanuele Carpanzano is Director of the Department of innovative technologies at the University of Applied Sciences and Arts of Southern Switzerland (SUPSI). He managed numerous research initiatives at international, European, national and regional level, as well as industrial research and technology transfer projects. He is active in different federal and international associations and institutions dedicated to education, research and innovation programs and initiatives in the field of industrial engineering. His research interests and activities are focused on industrial control and automation systems, as well as on the digitalization of industrial systems and value chains, including evolution of related human aspects. He is Professor of industrial plants at SUPSI and author of more than 150 scientific papers, as well as of different industrial patents, in his applied research fields.

Keynote Speakers

Prof. Dr. LUIGI MARIA GALANTUCCI **Polytechnic University of Bari, Italy (CIRP Fellow)**

Full Professor in Technologies and Production Systems Dept. of Mechanics, Mathematics and Management, Politecnico di Bari since 2000. Deputy Rector for the Strategic Planning, Head of several laboratories of the DMMM – Politecnico di Bari: Rapid Prototyping and Reverse, Engineering and the MICROTRONIC Micromachining and Micro-measurement. Fellow for life since 2006 of CIRP – Collège International pour L'étude Scientifique des Techniques de Production Mécanique, now International Academy for Production Engineering. "Doctor Honoris Causa" conferred by the Academic Senate of the Polytechnic University of Tirana – PTU (Albania - October 16th, 2009). CEO and President of Polishape 3D srl, a spin-off company of Politecnico di Bari. Since the year 1981, he is involved in several research projects funded by the European Union, the Italian Minister of Public Education, the Italian Minister of the Scientific and Technological Research, the National Council of the Research, on: 3D scanning and measurement of micro components, Reverse Engineering, Rapid Prototyping and Additive Manufacturing, Laser Material Processing, Thermomechanical simulation of manufacturing processes (Welding, Heat Treatment, Forming), Manufacturing Processes, Computer Aided Manufacturing, Process Planning, Feature Technology, Manufacturing System Analysis and simulation, Biomechanics, Anthropometry.



Prof. Dr. ADAM GAŚKA **Cracow University of Technology, Poland (IMEKO Fellow)**



Born in Krakow, Poland. He finished his studies at Cracow University of Technology in 2007 (combined Bachelor and Master studies in the field of Automatics and Robotics) and at Cracow University of Economics in 2010 (Bachelor in the field of Commodity Science). In 2011 he was awarded a PhD with distinction at Faculty of Mechanical Engineering, Cracow University of Technology and was the youngest PhD promoted in 2011 at this university. In 2018 he was awarded higher doctorate degree - DSc (habilitation) also as a youngest scientist who received this degree on that year. He works as a researcher and a teacher at Cracow University of Technology since 2010, now as an associate professor. His scientific interests include coordinate metrology, portable coordinate systems including

AACMMs, LaserTrackers, triangulation and structured light scanners, topics related to measurements and systems accuracy assessment, calibration of measuring systems and material standards, numerical methods in metrology, methods for identification and correction of geometrical errors. He is an author/co-author of more than 90 research papers, from which 22 were published in JCR indexed international journals, and 3 patents. He presented his research at over a dozen international conferences. Prof. Gaśka is also a reviewer in many internationally recognized scientific journals for which he performed about 150 reviews and has a status of "Outstanding Reviewer" in three of them ("Precision Engineering", "Measurement" and "Measurement, Science & Technology"). He was the principal investigator in three research projects and a member of research group in 5 other projects, now he is the coordinator in European project and supervisor of one project for young researchers. As a member of accredited calibration lab he cooperates with many companies from different branches of industry. They include Volkswagen, Fiat Auto Poland, ALSTOM Power, ArcelorMittal, Hexagon Metrology GmbH, Carl Zeiss, Renishaw, etc.

Keynote Speakers

Prof. Dr. FRANCI PUŠAVEC

University of Ljubljana, Slovenia (CIRP Associate Member)

Prof. dr. Franci Pušavec is a researcher at the Faculty of Mechanical Engineering, University of Ljubljana (Slovenia), leading the Department for Management of Manufacturing Technologies and Laboratory for Machining. His scientific research work is focused on the field of "Production Technologies and Systems", primarily on the field of sustainable development of cutting processes, machining and cutting machines and their upgrades, and analysis, diagnostics and optimization of cutting processes. As a result of his work he has published 62 original scientific articles, of which 2 in Group I journal (first 5%) and 46 in Group II journals (first quarter). His standardized h-index is 20, with more than 1700 pure citations by WoS and Scopus. His work is active also in high TRL activities via international patents and development of innovative solutions mainly related with cryogenic cutting processes, machine based polishing, high-pressure pulsating jet assisted machining. As a result, some of those are brought to industrialization and industrial prototypes. His scientific bibliography also includes analyzes of the machinability of various difficult-to-machine materials, the impact on the machined surface integrity, and analyzes of the dynamics of cutting processes. He completed postdoctoral training at the RWTH University of Aachen (WZL - Laboratory for Machine Tools and Production Engineering), Germany, in the period 2015-2017, for a total of 2 years. For a short time in 2007 and then in 2008 he was a guest researcher at the University of Kentucky, Lexington, KY, USA (4 + 6 months), in 2009 at the ENISE Institute, Saint Etienne, France (1 month), and in 2014 again at the University of Kentucky, USA (1 month). In the international community, he serves as a member of the International Academy for Production Engineering. Additionally, also as a member of editorial board for three journals, as a reviewer for international scientific journals and member of scientific committees of different international conferences.



Conference Venue

The whole programme of the 14th International Scientific Conference MMA2021 - Flexible Technologies will be held in the new building of the Rectorate of the University of Novi Sad, situated just on near of the Danube River.



Rectorate Building



Main auditorium / Amphitheatre

Conference Program

| PLENARY SESSION: KEYNOTE PAPERS | |
|--|---|
| 11⁰⁰ ÷ 13⁰⁰ | Hall I (hybrid - onsite and online) (Main auditorium /Amphitheatre) |
| <p>Budak, E.: INCREASED PERFORMANCE AND FLEXIBILITY IN MACHINING THROUGH PROCESS MODELING</p> <p>Carpanzano, E.: HARMONIZING DIGITAL TRANSFORMATION AND HUMAN ASPECTS IN NEXT GENERATION PRODUCTION SYSTEMS</p> <p>Galantucci, L. M., Pellegrini, A., Guerra, M. G., Lavecchia, F.: 3D PRINTING OF PARTS USING METAL EXTRUSION: AN OVERVIEW OF SHAPING DEBINDING AND SINTERING TECHNOLOGY</p> <p>Gąska, A., Harmatys, W., Gąska, P., Śladek, J. RECENT ADVANCES IN SIMULATION METHODS FOR DETERMINATION OF MEASUREMENT UNCERTAINTY</p> <p>Pušavec, F.: GREEN AND SUSTAINABLE MACHINING PROCESSES AS A BASIS FOR INNOVATIONS</p> | |

| Section A: MATERIAL REMOVAL TECHNOLOGIES | | |
|--|--|---|
| 14³⁰ ÷ 15⁴⁵ | HALL II (hybrid - onsite and online) (1 st floor, Room I-16) | <u>Session Chair:</u> Marin Gostimirović Dragan Rodić |
| 1. | Madić, M., Janković, P., Petković, D., Gostimirović, M., Rodić, D.: OPTIMIZATION OF MATERIAL REMOVAL RATE IN CO ₂ LASER CUTTING OF AN ALUMINUM ALLOY | |
| 2. | Rodić, D., Gostimirović, M., Sekulić, M., Madić, M., Kulundžić, N.: INFLUENCE OF PULSE DURATION ON SURFACE ROUGHNESS IN ASSISTING ELECTRODE ELECTRIC DISCHARGE MACHINING | |
| 3. | Trifunović, M., Madić, M., Vitković, N.: CUTTING PARAMETERS OPTIMIZATION FOR MINIMIZING ENERGY CONSUMPTION IN MULTI-PASS TURNING OF GREY CAST IRON | |
| 4. | Sredanović, B., Čiča, Đ., Tešić, S., Borojević, S., Kramar, D.: EXPERIMENTAL ANALYSIS AND OPTIMIZATION OF THIN-WALLED TUBULAR PARTS MILLING | |
| 5. | Banciu, F. V., Pamintas, E.: METAL CUTTING IS IT STILL OF INTEREST TO ANYONE? | |
| 6. | Kurbegović, R., Janjić, M.: JET LAGGING IN ABRASIVE WATER JET CUTTING OF TOOL STEEL | |
| 7. | Antić, A., Ungureanu, N., Čep, R., Lukić, D., Milošević, M.: TOOL WEAR CONDITION MONITORING BASED ON FUZZY SYSTEM | |
| 8. | Sekulić, M., Rodić, D., Gostimirović, M., Savković, B., Aleksić, A., Kulundžić, N.: MODELING OF TORQUE AND THRUST FORCE IN DRILLING USING GENETIC ALGORITHM | |

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| 9. | Nedić, B., Baralić, J.: EXPERIMENTAL INVESTIGATION OF THE INFLUENCE OF MACHINING PARAMETERS ON CUT QUALITY IN MDF LASER CUTTING |
| 10. | Aleksić, A., Sekulić, M., Gostimirović, M., Rodić, D., Savković, B., Antić, A.: EFFECT OF CUTTING PARAMETERS ON CUTTING FORCES IN TURNING OF CPM 10V STEEL |

| Section B: MACHINE TOOLS AND AUTOMATIC FLEXIBLE TECHNOLOGICAL SYSTEMS, CAX AND CIM PROCEDURES AND SYSTEMS | | |
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| 14³⁰ ÷ 15⁴⁵ | HALL III (hybrid - onsite and online) (2 nd floor, Room II-13) | <u>Session Chair:</u> Milan Zeljković Slobodan Tabaković |
| 1. | Slavković, N., Vorkapić, N., Živanović, S., Dimić, Z., Kokotović, B.: VIRTUAL BISCARA ROBOT INTEGRATED WITH OPEN-ARCHITECTURE CONTROL SYSTEM | |
| 2. | Nikolić, V., Tabaković, S.: DEVELOPMENT OF POST-PROCESSOR FOR CNC MACHINE TOOLS WITH HYBRID DEFINITION OF GEOMETRIC PARAMETERS OF TOOL PATH | |
| 3. | Tabaković, S., Živanović, S., Dimić, Z., Zeljković, M.: PROGRAMMING AND PROGRAM VERIFICATION OF 3-AXIS HYBRID KINEMATICS CNC MACHINE FOR RAPID PROTOTYPING | |
| 4. | Ižol, P., Varga, J., Vrabel, M., Demko, M., Greš, M.: EVALUATION OF 3-AXIS AND 5-AXIS MILLING STRATEGIES WHEN MACHINING FREEFORM SURFACE FEATURES | |
| 5. | Grešová, Z., Ižol, P., Maňková, I., Vrabel, M.: THE EFFECT OF CUTTER PATH STRATEGIES ON SURFACE ROUGHNESS WHEN MACHINING TITANIUM ALLOY | |
| 6. | Bojanić Šejat, M., Rackov, M., Knežević, I., Živković, A.: MODAL ANALYSIS OF BALL BEARINGS USING FINITE ELEMENT METHOD | |
| 7. | Santoši, Ž., Šokac, M., Budak, I., Vukelić, Đ.: INVESTIGATION OF DIFFERENT CIRCULAR IMAGE ACQUISITION METHODS IN CLOSE-RANGE PHOTOGRAMMETRY - VIRTUAL APPROACH | |
| 8. | Đekić, P., Milutinović, B., Ristić, M., Pavlović, M., Kostić, N., Nikolić, M., Jovković S.: REENGINEERING OF BRAKE TRIANGLE BY USING CAD/CAM APPLICATIONS | |

| Section C: METROLOGY, QUALITY, FIXTURES, CUTTING TOOLS AND TRIBOLOGY | | |
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| 14³⁰ ÷ 15⁴⁵ | HALL IV (hybrid - onsite and online) (Ground floor) | <u>Session Chair:</u> Đorđe Vukelić Branko Štrbac |
| 1. | Ranisavljev, M., Štrbac, B., Janković, P., Lanc, Z., Matin, I., Hadžistević, M.: THE IMPORTANCE OF MEASURING SYSTEM ANALYSIS IN PROCESS CAPABILITY ASSESSMENT | |
| 2. | Janković, P., Madić, M., Štrbac, B., Hadžistević, M., Mladenović, P.: APPLICATION OF GAGE R&R FOR EVALUATION MEASUREMENT SYSTEM PRECISION: CASE STUDY | |

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| 3. | Terek, V., Miletić, A., Kovačević, L., Škorić, B., Kukuruzović, D., Drnovšek, A., Panjan, P., Terek, P.: COMPARISON OF TWO METHODS USED FOR EVALUATION OF HIGH TEMPERATURE TRIBOLOGICAL PERFORMANCE OF PROTECTIVE COATINGS |
| 4. | Anania, F. D., Bisu, C. F., But, A., Canarache, M. R.: STUDY CONCERNING THE STIFFNESS EVALUATION FOR A MODULAR CLAMPING DEVICES |

| Section D: PROCESS PLANNING, OPTIMIZATION, LOGISTICS AND INTERNET TECHNOLOGIES IN PRODUCTION ENGINEERING | | |
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| 16 ⁰⁰ ÷ 17 ¹⁵ | HALL II (hybrid - onsite and online) (1 st floor, Room I-16) | <u>Session Chair:</u> Vidosav Majstorović Dejan Lukić |
| 1. | Majstorović, V., Stojadinović, S.: RELATIONS BETWEEN ERP AND INDUSTRY 4.0 MODEL | |
| 2. | Tomov, M., Velkoska, C.: ANALYSIS AND TRENDS OF THE CHANGES IN THE GRAPHIC INTERPRETATION OF THE QUALITY COSTS MODELS | |
| 3. | Nedeljković, D., Jakovljević, Ž.: IMPLEMENTATION OF CNN BASED ALGORITHM FOR CYBER-ATTACKS DETECTION ON A REAL-WORLD CONTROL SYSTEM | |
| 4. | Banciu, F. V., Pamintas, E., Feier, A. I.: THE APPLICATION OF NEW INDUSTRIAL MAINTENANCE CONCEPTS - AN EASY WAY TO SAVING MONEY | |
| 5. | Turudija, R., Arandžević, J., Stojković, M., Korunović, N.: ASSAY ON CLOUD BASED PRODUCT LIFECYCLE MANAGEMENT – OPEN PRODUCT AND TECHNOLOGY DEVELOPMENT WITHIN EDUCATION | |
| 6. | Trstenjak, M., Opetuk, T., Cajner, H., Dukić, G.: PROCESS PLANNING AND INDUSTRY 4.0 – THE IMPORTANCE OF STRATEGICALLY DEFINED TRANSITION TOWARDS DIGITAL WORK ENVIRONMENT | |
| 7. | Randžević, S., Milutinović, M., Movrin, D., Kostić, N.: NEW GENERATION OF PRODUCTION SYSTEM ACCORDING TO THE CONCEPT I4.0 | |
| 8. | Milosavljević, M., Slobodan, M., Fajsi, A.: INDUSTRY 4.0: A REVIEW OF TECHNOLOGY INFLUENCE ON BUSINESS MODELS | |
| 9. | But, A., Canarache, R., Gal, L.: IMPROVE PRODUCTIVITY THROUGH DIGITAL MANUFACTURING | |
| 10. | Tešić, Z., Kuzmanović, B., Tasić, N., Škorić, B.: KEY DIMENSIONS FOR SUCCESSFUL APPLICATION OF BUSINESS PROCESS MANAGEMENT MODEL | |
| 11. | Milošević, M., Lukić, D., Ostojić, G., Lazarević, M., Antić, A.: APPLICATION OF CLOUD-BASED MACHINE LEARNING IN CUTTING TOOL CONDITION MONITORING | |

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| Section E: MATERIALS, METAL FORMING, CASTING AND WELDING | | |
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| 16 ⁰⁰ ÷ 17 ¹⁵ | HALL III (hybrid - onsite and online) (2 nd floor, Room II-13) | <u>Session Chair:</u> Branko Škorić Lazar Kovačević |
| 1. | Bobić, Z., Petrović, B., Kojić, S., Terek, V., Škorić, B., Kovačević, L., Stojanović, G., Terek, P.: A PRELIMINARY STUDY OF VARIOUS MOUTHWASH INFLUENCE ON NITi ALLOY CORROSION | |
| 2. | Kukuruzović, D., Kovačević, L., Terek, P., Terek, V., Škorić, B., Miletić, A., Panjan, P., Čekada, M.: THE INFLUENCE OF COATING DEFECTS OF CRALN COATING CHEMICAL COMPOSITION ON COATING DELAMINATION DURING HPDC | |
| 3. | Milutinović, M., Konjović, Z., Ranđelović, S., Movrin, D., Vilović, M., Stefanović, Lj., Krašnik, M.: RECENT ACHIEVEMENTS IN THE PRODUCTION OF BI AND MULTI-METAL COMPONENTS BY METAL FORMING TECHNOLOGIES | |
| 4. | Janjatović, P., Rajnović, D., Erić Cekić, O., Baloš, S., Dramićanin, M., Šiđanin, L.: THE PROPERTIES AND APPLICATION OF DUAL PHASE AUSTEMPERED DUCTILE IRONS | |
| 5. | Čabrilo, A.: INFLUENCE OF HEAT INPUT ON THE BALLISTIC PERFORMANCE OF ARMOR STEEL WELDMENTS | |
| 6. | Dramićanin, M., Janjatović, P., Adamović, S., Kulundžić, N., Zabunov, I., Rajnović, D., Baloš, S.: INFLUENCE OF MICRO AND NANO PARTICLES ON THE PERFORMANCE OF ACTIVATED TUNGSTEN INERT GAS WELDING | |
| 7. | Lanc, Z., Zeljković, M., Hadžistević, M., Štrbac, B., Labus Zlatanović, D., Baloš, S.: EMISSIONS OF METAL SURFACE COATING | |

| Section F: MECHANICAL ENGINEERING AND ENVIRONMENTAL PROTECTION | | |
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| 17 ³⁰ ÷ 18 ³⁰ | HALL III (hybrid - onsite and online) (2 nd floor, Room II-13) | <u>Session Chair:</u> Boris Agarski Milana Ilić Mićunović |
| 1. | Plavac, F., Pavković, D., Trstenjak, M., Cipek, M., Benić, J., Lisjak, D.: SPEED CONTROL OF A SERIES DC DRIVE FOR DRILLING APPLICATIONS WITH VIBRATION DAMPING TORQUE FEEDBACK LOOP | |
| 2. | Miljković, Z., Jevtić, Đ., Svorcan, J.: REINFORCEMENT LEARNING APPROACH FOR AUTONOMOUS UAV NAVIGATION IN 3D SPACE | |
| 3. | Ilić Mićunović, M., Novaković, T., Agarski, B., Čepić, Z., Vukelić, Đ., Budak, I.: ECO-LABELS AS A TOOL FOR CIRCULAR ECONOMY AND CIRCULAR PACKAGING | |
| 4. | Kosec, B., Cigić, L., Ilić Mićunović, M., Klobčar, D., Nagode, A.: DUST PARTICLES EMISSIONS AT STEEL CUTTING PROCESSES | |
| 5. | Mijanović, K., Kopač, J.: SUSTAINABLE PRODUCTION TO LONG-TERM ECONOMIC DEVELOPMENT | |

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| 6. | Stanivuk, T., Dujmović, M., Dumanić, N., Barač, M.: AUTOMATION OF CONTROL OF ELECTRO-PNEUMATIC (PNEUMATIC) SYSTEM WITH AND WITHOUT PROGRAMMABLE LOGICAL CONTROLLER PLC |
| 7. | Dudić, B., Kovač, P., Savković, B.: INDUSTRIAL ROBOTS APLICATION |

| Section G: ADDITIVE MANUFACTURING TECHNOLOGIES | | |
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| 17³⁰ ÷ 18³⁰ | HALL II (hybrid - onsite and online) (1 st floor, Room I-16) | <u>Session Chair:</u> Mladimir Milutinović Dejan Movrin |
| 1. | Vasileška, E., Demir, A. G., Colosimo, B. M., Gečevska, V., Previtali, B.: ENERGY INPUT ADAPTATION ACCORDING TO PART GEOMETRY IN SELECTIVE LASER MELTING THROUGH EMPIRICAL MODELLING OF THERMAL EMISSION | |
| 2. | Ignjatović Stupar, D., Chabrol, G. R., Baraze, A. R. I., Lecler, S., Tessier, A., Cutard, T., Brendle, J.: FEASIBILITY OF ADDITIVE MANUFACTURING PROCESSES FOR LUNAR SOIL SIMULANTS | |
| 3. | Đekić, P., Milutinović, B., Tomić, M., Nikolić, S.: INFLUENCE OF PRINTING PARAMETARS AT MECHANICAL PROPERTIES OF FDM PRINTINGS PARTS MADE FROM ABS | |
| 4. | Movrin, D., Pitać, D., Knežević, P., Milutinović, M., Kojić, S., Premčevski, V.: COMPARISON OF MECHANICAL PROPERTIES OF REGULAR AND ANTIBACTERIAL 3D PRINTED PLA SPECIMENS | |
| 5. | Čirić Kostić, S., Bogojević, N., Croccolo, D., Olmi, G., Sinđelić, V., Šoškić, Z.: EFFECTS OF MACHINING ON THE FATIGUE BEHAVIOUR OF STEEL COMPONENTS PRODUCED BY DMLS | |
| 6. | Sabotin, I., Jerman, M., Lebar, A., Valentinčič, J., Bötther, T., Kühnel, L., Zeidler, H.: EFFECTS OF PLASMA ELECTROLYTIC POLISHING ON SLM PRINTED MICROFLUIDIC PLATFORM | |

Conference Gala Dinner

Thursday, September 23, 2021, 19:00 h

Alaska barka, Ribarsko ostrvo 4, 21000 Novi Sad

<https://ribarskoostrvo.rs/rs/naslovna/restorani/alaskabarka.html>



Located on the bank of the Danube River, away from the city bustle, yet only 3 km away from the city center.



Conference Sightseeing Tour

Excursion to Petrovaradin Fortress and Sremski Karlovci

Friday, September 24, 2021

Departure in front of the Faculty of Technical Sciences at 11:00.

Departure to Petrovaradin. Walking through the town high street we will learn about the **birth house of Josip Jelačić** who came to be Croatian national hero, the **seat of the "šajkaši" river navy** and the old building in which the toll for crossing the Danube was charged.

Next we arrive to the Roman Catholic church of **St George** with its baroque altar and graves of local nobles, as well as to its cloister.

We will climb up the 214 steps to the fortress plateau wherefrom we will descend into its **underground** where we will spend around 45 minutes discovering its secrets. Be sure to wear warm clothes.

After enjoying the panorama of Novi Sad below us we will stroll pass the ateliers of local artists. On a nice and peaceful spot we will talk about Petrovaradin's long history.



We continue to Sremski Karlovci, the center of Serbian education, spirituality and culture in the period from the Great Emigration of Serbs until the beginning of the 20th century. Visit of the most important cultural and historical sights with a guide (**Orthodox Cathedral, Karlovci Grammar School, Karlovci Theological School, Fountain 'Four Lions', Patriarchy residence**). After walking through the center of Karlovci, we are going to have wine tasting and lunch at the **Dulka wine house**.

Conference Sightseeing Tour



The friendly hosts will welcome you with homemade brandy. "Dulka Winery" is one of the oldest wineries in Vojvodina, the first registered in the modern era of winemaking. It's history dates from the year 1920, when family great grandfathers inherited the business from their parents and become a part of the Great Cooperation of wine makers in Sremski Karlovci. Since then, they nourished their vineyards in cooperation with larger producers, developing their own processing facilities. Today, fourth and fifth generation are working together to the best of their abilities. "Dulka Winery" today has 10 acres of vineyards comprised of leading world sorts, up-to-date processing and storing systems for grapes. The whole winery, including the house turned in to the museum, is a testimony of how wine was made in the old days, together with the wine cellars.

Here we will have the opportunity to see the old tools for the production of wines, we will visit the top of underground from where we will have a view of the Chapel of Peace, where in 1699 was signed a famous Karlovac peace between Austria and its allies on one side and Turkey with its allies on the other side. After that, we will taste six types of wine with snacks and enjoy the traditional lunch in Vojvodina - a goulash with a noodle.

After lunch, return to Novi Sad around 16:00.

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