

Poznan University of Technology, Poland

International Scientific-Technical Conference

MANUFACTURING 2024







2024

8th International Scientific-Technical Conference MANUFACTURING 2024

STEERING COMMITTEE

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Adam HAMROL

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Jozef TÖRÖK, Technical University of Košice, Slovakia

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Wiesław URBAN, Bialystok University of Technology, Poland

Leonilde VARELA, University of Minho, Portugal

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Ralf WOLL, BTU Cottbus-Senftenberg, Germany

Nermina ZAIMOVIC-UZUNOVIC, University of Zenica, Bosnia & Herzegovina

Jozef ZAJĄC, Technical University of Košice, Slovakia

Danuta ZAWADZKA, Koszalin University of Technology, Poland

MANUFACTURING 2024

SPECIAL SESSION ORGANIZING COMMITTEES

Manufacturing and management tools increasing production efficiency in era of digitalization

Leonilde Varela, University of Minho, Portugal Justyna Trojanowska, Poznan University of Technology, Poland Vijaya Kumar Manupati, NITIE Mumbai, India Khrystyna Berladir, Sumy State University, Ukraine

Operational Excellence and Continuous Improvement/Innovation. Lean Thinking, Kaizen Philosophy, and Toyota Production System

Manuel F. Suárez-Barraza, Universidad de las Américas Puebla (UDLAP), Mexico Fernando González Aleu Gonzalez, Universidad de Monterrey, Mexico

Quality and metrology in production systems

Pop Marian Grigore, Technical University of Cluj-Napoca, Romania Popișter Florin, Technical University of Cluj-Napoca, Romania Câmpean Emilia Maria, Technical University of Cluj-Napoca, Romania Dragomir Mihai, Technical University of Cluj-Napoca, Romania

Quality Assurance For Sustainability Of Manufacturing Processes And Systems

Yuliia Denysenko, Sumy State University, Ukraine Vitalii Ivanov, Sumy State University, Ukraine Cesar Pinzon Acosta, Technological University of Panama, Panama Sławomir Luściński, Kielce University of Technology, Poland

Industry 5.0 - from theory to practice

Joanna Oleśków Szłapka, Poznan University of Technology, Poland Joaquin Ordieres- Miere, Universidad Politécnica de Madrid, Spain Adnan Corum, Bahçeşehir University, Turkey Miguel Afonso Sellitto, Universidade do Vale do Rio dos Sinos, Brazil

New perspectives in the development of material solutions and technologies for sustainable polymers and composites

Zaida Ortega, University of Las Palmas de Gran Canaria, Spain Sandra Paszkiewicz, West Pomeranian University of Technology, Poland Mateusz Barczewski, Poznan University of Technology, Poland

Advanced methods for additive manufacturing

Jakub Kaščak, Technical University of Košice, Slovakia Jozef Török, Technical University of Košice, Slovakia

2024

Intelligent Technologies in Production and Maintenance - Industry 4.0

Katarzyna Antosz, Rzeszow University of Technology, Poland Anna Burduk, Wrocław University of Science and Technology, Poland Arkadiusz Gola, Lublin University of Technology, Poland José Machado, University of Minho, Portugal

Innovations in design and manufacturing of customized medical products in the wake of digital healthcare revolution

Filip Górski, Poznan University of Technology, Poland Răzvan Păcurar, Technical University of Cluj-Napoca, Romania Joaquín Francisco Roca González, Polytechnic University of Cartagena, Spain Michał Rychlik, Poznan University of Technology, Poland

Intelligent Solutions for Industry 4.0 and 5.0

Izabela Rojek, Kazimierz Wielki University in Bydgoszcz, Poland Ewa Dostatni, Poznan University of Technology, Poland Alzbeta Sapietova, University of Žilina, Slovakia

Sustainable Manufacturing and Maintenance in the Industry 4.0 Context

Małgorzata Jasiulewicz-Kaczmarek, Poznan University of Technology, Poland Chiara Franciosi, University of Lorraine, France Alexandre Voisin, University of Lorraine, France Robert Čep, VSB - Technical University of Ostrava, Czech Republic

WELCOME ADDRESS

The 8th International Scientific-Technical Conference MANUFACTURING, held in Poznan, Poland is organized by the Faculty of Mechanical Engineering, Poznan University of Technology, under the scientific auspices of the Polish Academy of Sciences – the Committee on Machine Building, and the Production Engineering Committee.

The aim of this year's conference is to review the state of knowledge, present results of scientific work, implementations and innovations, and to provide an international forum for the dissemination and exchange of experience in the fields of machine design and manufacturing, manufacturing technologies, metrology, and management and production engineering. The conference provides opportunity to discuss and exchange views and opinions in the area of automation strategies, digitalization and improvement of process efficiency, with particular emphasis on sustainable practices. The conference facilitates networking and cooperation of the scientific community with partners from industry and business, as well as with domestic and foreign research and development centers.

We received 231 manuscripts. After a thorough peer-review process, a committee accepted 107 full papers and 36 extended abstracts prepared by 394 authors from 31 different countries (acceptance rate of about 56%). All full papers have been published by Springer in Lecture Notes in Mechanical Engineering. Articles are organized into five books according to the main conference topics:

- Advances in Manufacturing IV Volume 1 Mechanical Engineering: Digitalization, Sustainability and Industry Applications
- Advances in Manufacturing IV Volume 2 Production Engineering: Digitalization, Sustainability and Industry Applications
- Advances in Manufacturing IV Volume 3 Quality Engineering: Digitalization, Sustainability and Industry Applications
- Advances in Manufacturing IV Volume 4 Measurement and Control Systems: Digitalization, Sustainability and Industry Applications
- Advances in Manufacturing IV Volume 5 Biomedical Engineering: Digitalization, Sustainability and Industry Applications.

We especially thank the organizers of special sessions, reviewers, and members of the international Program Committee for their hard work during the reviewing process, and acknowledge all who contributed to the staging of MANUFACTURING 2024: authors, committees, partners and sponsors. Their involvement and hard work were crucial to the success of the conference.

May, 2024

Adam HAMROL Olaf CISZAK Magdalena HRYB Justyna TROJANOWSKA

2024

CONFERENCE SPRINGER BOOKS



Advances in

Manufacturing

Advances in Manufacturing IV – Volume 1 – Mechanical Engineering: Digitalization, Sustainability and Industry Applications

Bartosz GAPIŃSKI, Poznan University of Technology, Poland Olaf CISZAK, Poznan University of Technology, Poland Vitalii IVANOV, Sumy State University, Ukraine Jose Mendes MACHADO, University of Minho, Portugal

Advances in Manufacturing IV – Volume 2 – Production Engineering: Digitalization, Sustainability and Industry Applications

Justyna TROJANOWSKA, Poznan University of Technology, Poland Agnieszka KUJAWIŃSKA, Poznan University of Technology, Poland Ivan PAVLENKO, Sumy State University, Ukraine Jozef HUSÁR, Technical University of Košice, Slovakia

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Digitalization, Sustainability and Industry Applications Adam HAMROL, Poznan University of Technology, Poland Marta GRABOWSKA, Poznan University of Technology, Poland Marcin HINZ, Munich University of Applied Sciences, Germany

Advances in Manufacturing IV – Volume 3 – Quality Engineering:



Advances in Manufacturing IV – Volume 4 – Measurement and Control Systems: Digitalization, Sustainability and Industry Applications

Magdalena DIERING, Poznan University of Technology, Poland Michał WIECZOROWSKI, Poznan University of Technology, Poland Mukund HARUGADE, Padmabhooshan Vasantraodada Patil Institute of Technology, India



Advances in Manufacturing IV – Volume 5 – Biomedical Engineering: Digitalization, Sustainability and Industry Applications

Filip GÓRSKI, Poznan University of Technology, Poland Răzvan PĂCURAR, Technical University of Cluj-Napoca, Romania Joaquín ROCA GONZÁLEZ, , Polytechnic University of Cartagena, Spain Michał RYCHLIK, Poznan University of Technology, Poland



Authors of the selected papers will be invited to submit extended contributions to Management and Production Engineering Review (further review and article processing charge are required)

GENERAL CHAIR



Adam HAMROL

He is head of the Production Management and Engineering Department at Poznan University of Technology, Poland. Alexander von Humboldt Scholarship at the University of Hannover. Dean of the Faculty of Mechanical Engineering and Management in 1999–2005 and Rector of the Poznan University of Technology from 2005–2012. Main research area: production engineering and quality management. Author of 8 books and about 250 scientific papers. Editor-in-chief of Management and Production Engineering Review (MPER). He cooperates with many companies as a researcher or adviser. Winner of the XII ed. (2009) of the Polish Quality Award in the scientific category. Member of the Committee on Machine Building and the Committee on Production Engineering of the Polish Academy of Sciences. Doctor Honoris Causa of the Cracow University of Technology.

CHAIRS



From the left: Olaf CISZAK, Justyna TROJANOWSKA, Magdalena HRYB, Adam HAMROL

ORGANIZING COMMITTEE



From the left: Ewa DOSTATNI, Paulina REWERS, Michał JAKUBOWICZ, Magdalena HRYB, Bartosz GAPIŃSKI, Agnieszka KUJAWIŃSKA, Justyna TROJANOWSKA, Anna KARWASZ, Marta GRABOWSKA

CONFERENCE PROGRAM

Day 1	May 14 (Tuesday)	
Time	Event	Room/Info
10:00-14:00	Registration + Morning Coffee and Snacks	Hall 1st floor / 053
11:00-13:00	Opening Ceremony, Best Paper Awards, Keynote Speakers	CW7
13:00-13:05	Group Photo	Stairs at the back of the CW
13:05-14:00	Lunch	053
14:00-15:30	Campus & Labs Walking Tour	Start point: in front of the CW
15:30-17:00	Science & Industry & Business Discussion Panel + Coffee	053
18:30-21:00	Ice Breaker Party	MK Bowling, MM Gallery

Day 2	May 15 (Wednes	day)	
Time	Event		Room/Info
09:00-10:30	Morning Coffee and Snacks		053
09:00-10:30	Poster Session		Hall
10:30-11:00	Coffee Break		053
11:00-12:30	Session 1.1	Session 1.2	CW7 / CW8
12:30-13:30	Lunch		053
13:30-15:00	Session 2.1	Session 2.2	CW7 / CW8
15:00-15:30	Coffee Break		053
15:30-17:00	Session 3.1	Session 3.2	CW7 / CW8
18:30-23:00	Gala Dinner (PUT)		053

Day 3	May 16 (Thursda	y)	
Time	Event		Room/Info
08:30–09:00	Morning Coffee and Snacks		053
09:00-10:30	Session 4.1	Session 4.2	CW7 / CW8
10:30-11:00	Coffee Break		053
11:00-12:30	Session 5.1	Session 5.2	CW7 / CW8
12:30-13:30	Lunch		053
13:30-15:00	Session 6.1	Session 6.2	CW7 / CW8
15:00-16:00	Coffee Break		053
15:00-16:00	Closing Remarks, Best Poste	er & Presentation Awards Ceremony	053



CONFERENCE VENUE

Lecture and Conference Centre of Poznan University of Technology (CW)







EVENTS & SOCIAL ACTIVITIES

Day 1, May 14 (Tuesday)

2:00 pm | Campus & Labs Walking Tour Start Point: in front of the CW

Lecture and Conference Centre of Poznan University of Technology / Piotrowo 2 Street, Poznan

6:30 pm | Ice Breaker Party – MKBowling Meeting Point: MM Gallery

MM Galery / Święty Marcin Street 24, Poznan







Day 2, May 15 (Wednesday)

6:30 pm | Gala Dinner Room 053 in CW



CONFERENCE SCHEDULE Day 1, May 14 (Tuesday) KEYNOTES



Piotr D. MONCARZ

Adjunct Professor, Stanford University Chairman, USPTC

Plenary paper: Al in manufacturing – how to prepare new cadres?

The presentation will address the perplexing phenomena of change in the relation human-machine at the close-to-home level. As AI revolutionizes manufacturing, Poland stands at a critical juncture. The new generation of machines learns from past experiences and observations, shaping decision-making. But what about us, the human workforce? Let's ensure Poland doesn't miss the transformative AI train.

Piotr D. MONCARZ

In 1968 he graduated from the Bridge and Road Construction department of Surveying and Road Technology vocational school in Poznań, Poland, and in 1981 with a Ph.D. from the School of Engineering at Stanford University. He is an Adjunct Professor at Stanford University, where for 30 years he has been teaching post-license level engineering classes. In the years 1980–2022 he was an employee of the world's leading engineering and scientific consulting firm, Exponent Failure Analysis Associates (www.exponent.com), from which he retired with the highest professional title of Senior Fellow. In 2017 he was admitted to the National Academy of Engineering of the United States. He specializes in investigation and prevention of engineering and scientific disasters. He is an author of dozens of publications, lectures and speeches. Renewable energy, especially geothermic energy, have been the focus of his many years of work (www.xgsenergy.com). He is the Co-founder and Chairman of the US-Polish Trade Council (www.usptc.org), an organization of professionals working on knowledge transfer and innovative science, technology, and engineering towards strengthening cooperation between Poland and the United States. He is vice-president of the Council of Polish Engineers of North America; Member of the 1st Council of the National Center for Research and Development (NCBR) of Poland. He was a co-organizer and academic director at Stanford University of the Top 500 Innovators program sponsored through the Ministry of Science and Higher Education of Poland. Co-founder of the Polish electromobility program, and for many years chairman of its Board of Directors. Engineer, entrepreneur, and academic teacher.

Day 1, May 14 (Tuesday)



Mirosław PAJOR

Prof. PhD Eng. West Pomeranian University of Technology in Szczecin

Plenary paper: Selected aspects of production digitalization and technology of Digital Twins

The paper will present the Digital Twins technology in accordance with the ISO 23247 standard. The digital representation of OMEs (Obervable Manufacturing Elements) will be discussed. Examples of the use of Digital Twins technology to model selected technical problems will be presented.

Mirosław PAJOR

Graduated from the Faculty of Mechanical Engineering at the Szczecin University of Technology in 1991. In the same year, he started working as an assistant at the Faculty of Mechanical Engineering at the Szczecin University of Technology. In 1997 he obtained a PhD. In the following years he continued his work as an assistant professor at the Institute of Mechanical Technology. In 2006 he obtained the postdoctoral degree in the discipline of machine construction and exploitation. In 2008 he was employed as an associate professor at the Szczecin University of Technology (West Pomeranian University of Technology in Szczecin since 2009). Since 2007 he has been the head of the Mechatronics Center at the Faculty of Mechanical Engineering and Mechatronics. From 2005 to 2012 he was the Deputy Director of the Institute of Mechanical Technology, and from 2012 to 2016 he was the Director of the Institute. He was currently is the Dean of the Faculty of Mechanical Engineering and Mechatronics for the 2020-2024 term. He specializes in: modeling and research of machining processes, dynamics of machine tools and robots, designing of machine diagnostic systems and mechatronics. He published around 150 works. In the last eight years he managed five research projects carried out in cooperation with industrial partners. He promoted six doctors and currently cooperate with five doctoral students. He was a member and an expert of: PTMTS (from 1998), Section of Dynamics - Committee of Mechanics of the Polish Academy of Sciences (2007-2014), Section of Machine Technology - Committee on Machine Building of the Polish Academy of Sciences (from 2007) and Mechatronics Section – Committee on Machine Building of the Polish Academy of Sciences (2011–2014). Currently (since 2020) he is a member of the Presidium of the Committee on Machine Building of the Polish Academy of Sciences and serves as deputy chairman.

Day 2, May 15 (Wednesday)

POSTER SESSION Time 09:00-10:30 | Chair: Michał JAKUBOWICZ | Hall

No	Authors	Poster Title
1.	Mariusz Salwin, Andrzej Kraslawski, Michał Andrzejewski, Magdalena Hryniewicka	Product-Service System Design - A case study for Parking Furniture Industry
2.	Johan Rojas, Karen Carranza, María de los Ángeles Campos	The medical device industry in a Kaizen environment in the year 2050 Costa Rica Case Study
3.	Luis Suárez, Aoife Ní Mhuirí, Bronagh Millar, Mark McCourt, Eoin Cunningham, Zaida Ortega	Recyclability Assessment of Lignocellulosic Fiber Composites: Reprocessing of Giant reed/HDPE Composites by Compression Molding
4.	Oleg Krol, Vladimir Sokolov, Oleksandr Logunov	Technological Innovations in the Design of Worm Gears for Tool Magazine of Multioperational Machine
5.	Karol Goryl, Martin Pollák, Marek Kočiško, Martin Koroľ	Comparison of PLA and PLA Carbon Fiber materials on tensile test
б.	Bartłomiej Krawczyk, Piotr Szablewski, Bartosz Gapiński, Michał Wieczorowski	Assessment of threads used in the aviation industry based on the microstructure analysis
7.	Izabela Rojek, Dariusz Mikołajewski, Sławomir Przybyliński, Ewa Dostatni, Alžbeta Sapietová	Toward ML-based application for vehicles operation cost management
8.	Anna Borucka, Krzysztof Patrejko, Łukasz Patrejko, Polakowski Konrad	Optimization and evaluation of storage processes based on a selected example
9.	Anna Borucka, Łukasz Patrejko, Krzysztof Patrejko, Julia Lipińska	Selected Methods for Improving the Quality of Production Processes
10.	Anna Karwasz, Igor Wawrzynowicz	Using visions systems and manipulators in Industry 4.0
11.	Michał Jakubowicz, Patryk Mietliński, Jolanta Królczyk, Grzegorz Budzik, Piotr Niesłony, Anna Trych-Wildner, Natalia Wojciechowska, Grzegorz Królczyk, Michał Wieczorowski, Julia Staśkiewicz, Tomasz Bartkowiak	Parametric evaluation samples made by SLM technology measured using micro-computed tomography
12.	Krzysztof Smak, Piotr Szablewski, Stanisław Legutko	Evaluation of the tool set overhang effect on surface topography in the finisz turning process of Inconel 718 alloy

No	Authors	Poster Title
13.	Andrzej Loska, Waldemar Paszkowski, Robert Waszkowski	The scenario approach to the concept of maintenance of technical systems of urban engineering
14.	Waldemar Paszkowski, Andrzej Loska, Robert Waszkowski	A method for developing acoustic maps for noise management in terms of the SmartCity concept
15.	Emilia Campean, Claudiu Adrian Serban, Mihai Ciupan, Grigore Pop	Detecting Motor Defects Using Noise Analysis
16.	Krzysztof Łukaszewski, Paweł Buń, Anna Karwasz	Comparison of Monorail Vehicle Dynamic Behavior in Unity and Universal Mechanism
17.	Martin Korol', Jozef Török, Karol Goryl, Adrián Vodilka	Research of selected TPMS structures made of ABS and Nylon 12 CF material using the FDM7
18.	Sara Díaz, Zaida Ortega, Raúl Ríos	Characterization of microalgae biomass/PE biocomposites obtained by compression and rotational molding
19.	Sławomir Kłos, Justyna Patalas-Maliszewska	Throughput Evaluation of Serial-Parallel Manufacturing Systems for Different Production Flow Strategies
20.	Agnieszka Terelak-Tymczyna, Eliza Jarysz- Kamińska, Emilia Bachtiak-Radka	The Application of the Modified QFD Method for Assessing and Selecting Suppliers in a Company
21.	Reggie Davidrajuh, Damian Krenczyk, Bożena Skołud	Minimum Job Completion Time in Petri Nets
22.	Dalibor Jeřábek	Storage and Production of Hydrogen with Special Focus on Membraneless Electrolysis
23.	Katarzyna Piotrowska, Izabela Piasecka, Arkadiusz Gola, Ewelina Kosicka	Assessment of the Impact of Selected Segments of Road Transport on the Natural Environment using LCA Analysis
24.	Adrian Popescu, Catalin Moldovan, Emilia Campean, Grigore Pop	The Design of an Injection Mould for the "ENGINE BUFFER" Benchmark – Case Study
25.	Justyna Patalas-Maliszewska, Hanna Łosyk, Ewa Dostatni, Sławomir Kłos	loT-based Monitoring the Level of Sustainable Production: a Case of Energy Consumption in Turning Process
26.	Daniel Černý, Jiří Kuchař, Henryk Kania, Mariola Saternus	Verification of the Properties of Zinc Hot-dip Galvanized Steel Samples

No	Authors	Poster Title
27.	Wiktoria Kanciak, Dorota Czarnecka- Komorowska, Cezary Jędryczka, Dariusz Sędziak	The drum electrostatic separator application in the pol-ymers waste recycling based on end-of-life vehicles to composites manufacture
27.	Agnieszka Terelak-Tymczyna, Beata Niesterowicz	Lean Manufacturing in digital transformation of manufacture
29.	Jozef Török, Adrián Vodilka, Jakub Kaščak, Marek Kočiško	Design of personalized orthoses with support of PTC Creo and FDM technology
30.	Nikol Bachurová, Jan Kudláček, Stanisław Legutko	Effect of material and pretreatments on surface cleanliness
31.	Olexandr Prykhodko, Yuliia Denysenko, Oksana Dynnyk	Methodology for Developing a Quality Management System for Cylinder Sleeves Manufacturing
32.	Alejandra Avila, César Pinzón	Comparative Analysis of VGGish and YAMNet Models for Welding Defect Detection
33.	Filip Górski, Agnieszka Marciniak, Radosław Wichniarek, Wiesław Kuczko, Magdalena Żukowska, Justyna Rybarczyk	Development of 3D printed low-cost individualized actuated upper limb prostheses
34.	Mariusz Piechowski, Ryszard Wyczółkowski, Waldemar Paszkowski	The Concept of a System Supporting the Implementation of an Intelligent Lubrication Strategy within the Company Using Advanced Information Technologies
35.	Michał Wieczorowski, Bartosz Gapiński, Michał Jakubowicz, Dawid Kucharski, Karol Grochalski, Natalia Swojak, Lidia Marciniak- Podsadna, Maria Kuznowicz, Aleksandra Krawczyk, Jerzy A. Sładek, Rehan Khan	Influence of selected measurement conditions on the reliability of the representation of ring and rim features
36.	Magdalena Dąbrowska, Daniel Medyński, Dagmara Łapczyńska, Anna Burduk, Oleh Pihnastyi	Assessment of Risk and Production Losses Based on a Selected Carpentry Company
37.	Anna Dudkowiak, Ewa Dostatni, Alicja Czerw	Comparison of environmental analysis results from two IT tools based on an additive manufactured prosthesis
38.	Wiktoria Czernecka, Marcin Butlewski	Success factor driven adaptive approach to pro- ergonomic project management

No	Authors	Poster Title
39.	Jakub Kaščak, Marek Kočiško, Jozef Török, Adrián Vodilka	3D printing in non-planar layers as a new tool for increasing the quality of FDM production
40.	Khrystyna Berladir, Tetiana Hovorun, Justyna Trojanowska, Vitalii Ivanov, Angelina lakovets	Failure Analytics of Defects in Mechanical Engineering Parts Using Root Cause Analysis: Case Study
41.	Adeniyi Sobowale, Helena Lopes, Justyna Trojanowska, Ana Lima, Pedro Marujo, Jose Machado	Exploring the Potential of Digital Twins for New Product Design and Development: A Review of Research Gaps
42.	Hugo Silva, André S. Santos, Leonilde R. Varela, Justyna Trojanowska, Vitalii Ivanov	Virtual and Augmented Reality: past, present, and future
43.	Hugo Silva, André S. Santos, Leonilde R. Varela, Magdalena Diering, Khrystyna Berladir	A Racing Approach: The Evolution of Racing Techniques, a Systematic Literature Review
44.	Łukasz Łampika, Dagmara Łapczyńska, Joanna Kochańska, Anna Burduk, Kamil Musiał	Ensuring the stability of production processes using statistical models
45.	Jozef Husár, Stella Hrehová, Lucia Knapčíková, Piotr Trojanowski	Mixed Reality as a Perspective Education Tool in Industry 5.0
46.	Sławomir Cieślak, Przemysław Zawadzki, Jakub Gapsa	Digital twin application for vision control in the production of mechatronic ladders
47.	Jakub Matuszak, Krzysztof Ciecieląg, Agnieszka Skoczylas, Kazimierz Zaleski	The influence of shot peening and brushing on the deburring effectiveness and surface layer properties of 1.0503 steel
48.	Agnieszka Kujawińska, Magdalena Diering, Anna Przybył	Machine Vision System for Quality Control of Stents Used in Angioplasty
49.	Oliwia Krüger, Marta Grabowska	Improving the Student Engineer Educational Process by Teaching Economic Efficiency Calculations
50.	Lucia Knapčíková, Annamária Behúnová, Rebeka Tauberová, Matúš Martiček, Jozef Husár	Innovation of the Manufacturing Company by Using of Digitization Tools
51.	Krzysztof Karbowski, Bartosz Kopiczak,Konrad Nering, Ziemowit Malecha, Robert Chrzan, Jolanta Gawlik, Aleksandra Sucherska, Joanna Szalepiec	Reverse engineering and computational fluid dynamics in otolaryngology

No	Authors	Poster Title
52.	Jarosław Korpysa, Józef Kuczmaszewski, Ireneusz Zagórski	Dimensional accuracy of AZ91D magnesium alloy components after precision milling
53.	Paweł Pieśko, Magdalena Zawada- Michałowska	Effect of machining parameters and end mill geometry on chip formation and machined surface quality
54.	Magdalena Zawada-Michałowska, Paweł Pieśko	Effect of anisotropy on the machinability of an aluminium alloy component
55.	Ewelina Kosicka, Aneta Krzyzak, Edward Kozłowski , Robert Szczepaniak	Optimization of the Composition of Selected Polymer Composites with Physical Modifiers
56.	Lijo Paul, Pradeep P V	Investigation on Anterior Cruciate Ligament with SLA 3D printing
57.	Elżbieta Piesowicz, Sandra Paszkiewicz, Izabela Irska, Konrad Walkowiak, Monika Rzonsowska, Beata Dudziec, Mateusz Barczewski	Influence of the tetrafunctional double-decker silsesquioxane (DDSQ-eter-4OH) on the properties of compatibilized PLA/ENR thermoplastic vulcanizates
58.	Dariusz Afelt, Kinga Mencel, Paweł Brzęk, Marek Szostak	Anti-burglary Passive Telecommunication Cabinets Produced from Polymeric Material
59.	Joanna Aniśko, Luis Suárez, Zaida Ortega, Mateusz Barczewski	Valorization of invasive plant Solidago canadensis into a functional filler for polyethylene composites with improved thermo-oxidative stability
60.	Magdalena Diering, Agnieszka Kujawińska, Artur Meller, Jędrzej Iglewski, Krzysztof Żywicki, Adam Hamrol, Marcin Suszyński, Marta Grabowska, Justyna Trojanowska, Paulina Rewers	Assessment of the quality of the manufacturing process in digital representation of the water meter body production
61.	Damian Dziadowiec, Piotr Szymczak	CrystaLid – high barrier retortable monofilm for food packaging
62.	Damian Dziadowiec, Piotr Szymczak	Recyclable barrier APET film with sealing properties
63.	Magdalena Niemczewska-Wójcik	The multi-scale analysis of surface topography created in electrical discharge machining
64.	Krzysztof Żywicki, Magdalena Diering, Agnieszka Kujawińska, Jędrzej Iglewski, Przemvsław Łuczak	Digital Twin concept in production process control

No	Authors	Poster Title
65.	Michał Jakubowicz, Adam Gąska, Angelika Jarocha, Małgorzata Kujawińska, Tomasz Kowaluk, Krzysztof Stępień, Adam Wójtowicz, Mariusz Wiśniewski, Bartosz Gapiński, Natalia Swojak, Maria Kuznowicz, Michał Wieczorowski	Uncertainty determination method for measurements performed using hybrid measurement systems
66.	Marcin Moskwa, Michał Jakubowicz, Bartosz Gapiński	Challenges in controlling radial force variation of tyres
67.	Lidia Smyczyńska, Michał Wieczorowski, Bartosz Gapiński	Problems of diameter and form deviation measurement of incomplete round profile
68.	Bartosz Gapiński, Michał Wieczorowski, Rafał Reizer, Kazimiera Dudek, Grzegorz M. Królczyk, Piotr Niesłony, Andrzej Dzierwa, Paweł Pawlus	Possibilities of measuring topography on micro-CT
69.	Krzysztof Kalinowski, Damian Krenczyk	Application of scheduling techniques in the design of the assembly line supplying subsystem
70.	Paulina Kosmela, Wiktoria Żukowska, Mariusz Marć, Joanna Aniśko, Aleksander Hejna, Mateusz Barczewski	Determination of changes in the structure and thermal stability of waste biomass as potential fillers of polymer composites formed by rotational molding
71.	Paula Kolbusz, Katarzyna Antosz	The implementation of machine learning methods in Six Sigma projects – a literature review

CW8

2024

Day 2, May 15 (Wednesday)

SESSION 1.1 Time 11:00-12:30 | Chair: Jozef HUSÁR | CW7

Authors	Title
Karolina Wrześniowska, Cezary Grabowik	Consumer Awareness and Customization of Footwear in the Context of the Idea of Industry 4.0: Analysis of Survey Results
Manuel F. Suárez-Barraza, Jesús A. Chávez- Pineda, Dailin A. Ramirez Altamirano, María Isabel Huerta-Carvajal	The impact of KAIZEN on the operational performance of multinational manufacturing companies through the degree of maturity. A mixed study in Mexico
Manuel F. Suárez-Barraza, José Ángel Miguel-Davila, María Isabel Huerta-Carvajal	Applying Kaizen (Incremental Innovation) in a Mexican Handcrafted Talavera Company: a case study approach
Adam Olszewski, Paulina Kosmela, Aleksandra Ławniczak, Łukasz Piszczyk	New strategy for limiting environmental impact of catalyst-free polyurethane-wood composites (PU-WC)
Maciej Kaczor, Anna Timofiejczuk and Marcin Januszka	Application of load balancing methods to optimize the production of truck components
Alejandra Avila, César Pinzón-Acosta	Comparative Analysis of VGGish and YAMNet Models for Welding Defect Detection

SESSION 1.2 Time 11:00-12:30 | Chair: Anna BURDUK

Authors Title Jacek Diakun Quantitative Assessment of Product Recycling Properties Using Recycling Product Model Scrum Applications Outside Information Technology Fernando Gonzalez-Aleu, Valeria Carrizales-Ramirez, Mauricio Ramirez-Guajardo, Zayra Industry: A Systematic Literature Review and Future Araceli Bazaldua-Martínez, Julio Cesar Agenda Iriarte-de Luna Managing Pandemics in Airport Security Environ-ments: Vlad Vizitiu, Raul Henning, Mihai Dragomir A Comparative Analysis of Classic Airport Security and Smart Security Approaches Aleksander Hejna, Mateusz Barczewski, Upcycling furniture polyurethane foam wastes Joanna Aniśko, Adam Piasecki, Paulina Kosmela Mateusz Barczewski, Joanna Aniśko, Joanna Comparative studies of the technological-structural relationship of rotomolded composites filled with waste Szulc, Paulina Kosmela, Wiktoria Kanciak, Aleksander Hejna, Zaida Ortega functional fillers based on pistachio, walnut, and pecan shells Tomasz Górny Strenght calculations of thin-walled members according to international standards: limitation and reimplementation – literature review

Day 2, May 15 (Wednesday)

SESSION 2.1 Time 13:30-15:00 | Chair: Marek SZOSTAK | CW7

Authors	Title
Tomasz Olszewski, Danuta Matykiewicz	The influence of injection parameters on the thermomechanical properties of a polyamide product
Krzysztof Ciecieląg, Agnieszka Skoczylas, Jakub Matuszak	Recurrence analysis and feed force in drilling of polymer composites
Francisco Romero, Paula Douglas, Bronagh Millar, Zaida Ortega	Assessment of welded ignimbrite waste dust as a filler in rotomolded products: rheological and thermomechanical behavior of PP/ignimbrite composites
Sandra Paszkiewicz, Elżbieta Piesowicz, Konrad Walkowiak and Izabela Irska	Structure-property relationship in poly(hexamethylene 2,5-furandicarboxylate)- block-poly(tetramethylene oxide) copolymers with different flexible segment length
Aminul Islam, Bin Wang	Possibilities and challenges for Tomographic Volumetric 3D printing
Paulina Jakubowska, Arkadiusz Kloziński, Stanisław Kuciel, Robert Przekop	Green high density polyethylene composites with Opoka - hybrid natural filler

SESSION 2.2 Time 13:30-15:00 | Chair: Paulina REWERS | CW8

Authors	Title
Patrycja Guzanek, Piotr Bawoł, Grzegorz Sobecki	Assessment of the Functioning of Supply Chain Logistics in a Manufacturing Company from the Suppliers' Perspective
Joaquin Ordieres-Meré, Ahmad Rahabi, Daniel Falkowski, Nikolaos Matskanis, Jens Brandenburger, Carlos García-Castellano Gerbolés	Smart Workflows for Advanced Quality Assessment in Steel Industry: Benefits of 15.0
Ali Asghar Bataleblu, Erwin Rauch, David S. Cochran, Dominik T. Matt	Impact of European Sustainability Reporting Standards Guidelines on the Design of Sustainable Factories and Manufacturing Systems
Elahe Atarisharghi, Ali Asghar Bataleblu, Asja Emer, Michaela Golser, Erwin Rauch, Dominik T. Matt	Application of Life Cycle Assessment (LCA) in the Fast-Moving Consumer Goods Sector
Joanna Oleśków-Szłapka, Adnan Corum, Patrycja Hoffa-Dąbrowska, Agnieszka Stachowiak	Remanufacturing Electric Mobility: Challenges and Opportunities in Designing Circular Business Models
Łukasz Marchewka, Marek Grudziński	Preliminary testing of the accuracy of a 3D scanning tool and validation of its calibration procedures

Day 2, May 15 (Wednesday)

SESSION 3.1 Time 15:30-17:00 | Chair: Izabela ROJEK | CW7

Authors	Title
Joaquin Ordieres-Meré, Miguel Ángel Ortega-Mier	Challenges in Industry 5.0: Human Behavior Integration
Ankidim Zinveli, Mihai Dragomir	Risk Assessment in Collaborative Tasks: a Comparative Analysis - Qualitative Method and Quantitative Method
Damjan Maletič, Vladimir Todorović, Matjaž Maletič	A Study into the Critical Success Factors of an Asset Management System Implementation: a Review and Evaluation
Adam Górny	Guidelines and Needs for the Implementation of the ISO 45001 Requirements for Shaping of Safety in Industry 4.0
Alla Polyanska, Yuliya Pazynich, Zhanna Poplavska, Yuri Kashchenko, Vladyslaw Psiuk, Volodymyr Martynets	Conditions of Remote Work to Ensure Mobility in Project Activity
Mosè Gallo	An Artificial Neural Networks framework for improving inventory management decisions

SESSION 3.2 Time 15:30-17:00 | Chair: Magdalena ŻUKOWSKA | CW8

Authors	Title
Fernando Gonzalez-Aleu, Ivana Alexandra Saucedo-Gonzalez, Luis Jauregui-Sanchez, Sofía Villarreal-Garza, Mariana Dingles-Villarreal	Continuous Improvement Programs: Before and After the COVID-19 Pandemic
Dario Antonelli, Alessia Marina, Dorota Stadnicka, Paweł Litwin	Objective and Subjective Factors Affecting Neurodiverse Inclusion in Manufacturing
Berna Ulutas, Busra Nur Yetkin	A Human-Robot Collaboration Workstation Design to Assess Worker Physical Workload with JACK Software
Krzysztof Kotecki, Anna Napierała, Michał Rychlik	Automation of the determining parameters process used to assess the state of hip joint degeneration based on CT imaging
Zuzanna Bandosz, Michał Rychlik	Design and Finite Element Analysis of a custom wrist orthosis for 3D printing containing ventilation areas and wrist protection zones achieved by topological optimization
Filip Górski, Jakub Gapsa, Aleksandra Kupaj, Wiesław Kuczko, Magdalena Żukowska, Przemysław Zawadzki	Virtual Design Process of Customized 3D Printed Modular Upper Limb Prostheses

Day 3, May 16 (Thursday)

SESSION 4.1 Time 09:00-10:30 | Chair: Marta GRABOWSKA | CW7

Authors	Title
Eryk Szwarc, Paulina Golińska-Dawson, Grzegorz Bocewicz, Zbigniew Banaszak	Proactive resource maintenance in Product- as-a-Service business models: a constraints programming based approach for MFP offerings prototyping
Marek Fertsch, Agnieszka Stachowiak, Joanna Oleśków-Szłapka	Innovations – changes in the environment of the production planning process in enterprises
Wojciech Danilczuk, Arkadiusz Gola, Jakub Pizoń	Heuristic-Based Algorithm for Suboptimal Scheduling Realized in Hybrid Production Environment
Carmen Vilanova de Diego, Miguel Ortega-Mier, Tamara Borreguero, Álvaro García-Sánchez, Carlos García-Castellano Gerbolés	Comparison of different production systems approaches of a manufacturing line in the aeronautical sector
Hector Quintero, Elisa Elizabeth Mendieta, Cesar Pinzon-Acosta	Identifying an image classification model for welding defects detection
Erfan Babaee Tirkolaee, Selma Gütmen, Gerhard- Wilhelm Weber	A robust-reliable aggregate production planning problem considering operations failure under uncertainty

SESSION 4.2 Time 09:00-10:30 | Chair: Bartosz GAPIŃSKI | CW8

Authors	Title
Lennart Grüger, Tim Sebastian Fischer, Ralf Woll	Investigation of the Wire Arc Direct Energy Deposition-Process and Possible Interactions
Andreea Istrate	Contributions regarding parametrized design
Pramodkumar S Kataraki, Aulia Ishak, M. Mazlan, Isam Qasem, Ahmed A. Hussien, Ahmad Faiz Zubair, Ayub Ahmed Janvekar	Prediction of Cutting Forces for Machine Tools by Neural Networks
Aleksander Gardocki	Manufacturing multipole magnetic rings for encoders using the injection molding method with premagnetization
Kamila Sałasińska	Newly bio-based fire retardant systems for polymers
Dominik Rybarczyk, Daniel Wyrwał, Tymoteusz Lindner	Construction of an electronic safety system in a ladder

Day 3, May 16 (Thursday)

SESSION 5.1 Time 11:00-12:30	Chair: Sebastian SKOCZYPIEC CW7	
Authors	Title	
Agnieszka Skoczylas, Jakub Matuszak, Krzysztof Ciecieląg, Kazimierz Zaleski	Analysis of selected surface layer properties after ball burnishing of samples cut with a laser parallel and perpendicular to the rolling direction	
Florin Popister, Horea-Stefan Goia, Paul Ciudin	Development of an educational Cobot structure	
Berna Ulutas, Georgios Ioannou, Stefan Bracke	Assessing the Effectiveness and Efficiency of Selected Solution Approaches for Two- Dimensional Stock Cutting Problems (Part I): Case Study Printed Circuit Boards	
Marcin Grabowski, Emilia Franczyk, Marcin Małek, Sebastian Skoczypiec	Primary research on dry milling of AISI 316L stainless steel using coated monolithic carbide tools	
Igor Cudnik, Jacek Andrzejewski	Preparation and evaluation of the properties of FDM printed materials made from waste-origin polymers	
Danuta Matykiewicz, Oliwia Sienkiewicz	Lightweight sandwich epoxy composites reinforced with a 3D polyamide printed core	

SESSION 5.2 Time 11:00-12:30 | Chair: Justyna TROJANOWSKA | CW8

Authors	Title
Rehan Khan, Michał Wieczorowski, Ariba Qureshi, Muhammad Ammar, Tauseef Ahmed, Umair Khan	Recent Trends in Artificial Intelligence and Machine Learning Methods Applied to Water Jet Machining
Jan Dąbrowski, Tomasz Bartkowiak, Piotr Wierzchowski, Dariusz Dąbrowski	Manufacturing line-level root cause analysis and bottleneck detection using the digital shadow concept and cloud computing
Erwin Rauch, Ali Asghar Bataleblu, Michaela Golser, Asja Emer, Dominik T. Matt	Potential of Graph Database Visualization of the Supplier Network to Increase Resilience in Multi- Tier Supply Chains
Ankur Krishna, Rajesh Duraisamy	Geometric Complexity Evaluation Method for Adoption of Additive Manufacturing
Diana Dragomir, Florin Popişter, Kamil Erkan Kabak	Using AI tools to enhance the risk management process in the automotive industry

Day 3, May 16 (Thursday)

SESSION 6.1 Time 13:30-15:00 | Chair: Stanisław LEGUTKO | CW7

Authors	Title
Sławomir Nadolny, Michał Rogalewicz	Transition of controlled atmosphere brazing jig for aluminum heat exchangers from spring-loaded to fixed-dimension
Rosario-del-Pilar López Padilla, Margarita-Jesús Egúsquiza Rodriguez, Jaime-Enrique Molina Vilchez	Six sigma for the improvement of productivity for fiber to the home (FTTH) installations of an outsourcing service company
Paul Ciudin, Horea Ștefan Goia, Florin Popișter	Implementation of human gestures in the control of collaborative robots
Marcin Hinz, Alexander Lindworsky, Stefan Bracke	Qualification of AI-based surface topography inspection systems for inline measurement in series production: Tactile touch systems versus optical AI analysis
Ryszard Ziętek, Paweł Herbin, Mirosław Pajor	Prediction of skeletal muscle torque using electromyographic signals, based on artificial neural networks
Vladyslav Kondus, Ivan Pavlenko, Ján Piteľ, Oleksandr Kulikov, Volodymyr Rybalchenko, Vitalii Ivanov, Olaf Ciszak	Improvement of the Sewage System for the Nuclear Power Plant WWER-1000 Reactor

SESSION 6.2 Time 13:30-15:00 | Chair: Filip GÓRSKI | CW8

Title
Al-based Automated Custom Cranial Implant Design – Challenges and Opportunities with Case Study
Ti Implant Surface State After Micro-Arc Oxidation Process
Research on Mechanical Characteristics of 3D-Printed PEEK Material-Based Lattice Structures for Vertebral Implants
Research on Design and Manufacturing of PEKK- Based Mandibular Implants by Fused Deposition Modeling
Assessment of the usefulness of additively manufactured anatomical models in the process of preoperative support and education
Research on Design and Manufacturing of Pelvic Bone Structure by Fused Deposition Modeling Method

2024

POZNAN CITY

Poznan is the capital of Wielkopolska (Greater Poland)



Poznan is one of the most interesting places on the Polish tourist map. It combines a rich history with an intimate atmosphere. It is also sometimes called the "city of experiences".

Poznan is located in the central-western part of Poland. It is the largest city and the capital of the Wielkopolska region. It covers an area of 261.9 square kilometres, of which 48% is agricultural land and green areas. In terms of size, it is only the eighth largest city in Poland. More than 530,000 people live in Poznan, and almost 700,000 people use the city area. One of Poland's main rivers – the Warta – flows through the capital of the Wielkopolska region. Due to its central-western location, Poznan is well connected and serves as a road, rail and air hub. No less than 7 roads of interregional or international importance pass through the city, including the A2 highway. The Poznan railway junction provides direct connections to major cities in Poland and Europe.

The international airport in Ławica has two modern terminals from which we can fly to world cities such as London, Paris, Rome, Frankfurt, Monachium and Barcelona. More than 2 million tourists use Poznan Airport every year.

Its proximity to other Polish cities, such as Warsaw, Wroclaw and Lodz, makes the capital of the Wielkopolska region easily accessible to tourists not only from Poland. Poznan is a frequent host of international trade fairs and conferences. Poznan is one of the most visited cities in Poland. Its rich history, charming Old Town and numerous monuments attract crowds of tourists from all over the world. (https://www.national-geographic.pl)









POZNAN UNIVERSITY OF TECHNOLOGY

Poznan University of Technology in numbers:

- over 14 thousand students
- more than 1,300 academic Staff
- 9 faculties & 44 fields of study

Most of the PUT faculties' are on Warta Campus. One is located on the Kąkolewo campus in the form of a training hangar, built as part of the Aerosfera project.

The Warta Campus is situated in the center of the city – it takes 10 minutes to get to the Old Market from here and 5 minutes to get to the Malta lake – a favorite place of recreation of the city inhabitants.

Faculty of Mechanical Engineering

The Faculty of Mechanical Engineering was established in 1919 – the first, original faculty in the Higher School of Mechanical Engineering. In accordance with market expectations and in connection with structure modifications, it has changed its name several times. Between 1919 and 1952 it operated as the Faculty of Mechanics. It was then transformed successively into the Faculty of Machine Construction (1952–1967), the Faculty of Mechanics and Technology (1967–1974), again into the Faculty of Machine Construction (1974–1998), and in 1998 into the Faculty of Mechanical Engineering and Management. Since 1 January 2020, its name has been in keeping with the scientific discipline – the Faculty of Mechanical Engineering. The fields of study offered by the Faculty, which include Mechanical Engineering, Management and Production Engineering, Mechatronics and Biomedical Engineering, Product Lifecycle Engineering area – construction, technology, automation, diagnostics and computerization, management and production engineering. The Faculty has the right to confer doctoral and postdoctoral degrees of technical sciences in the discipline of mechanical engineering. There are currently four institutes operating at the Faculty.



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- 1. choose the network from the wireless card menu: PUT-events-WiFi
- 2. enter the key/password: politechnika
- 3. open any web browser and go to: http://www.put.poznan.pl
- 4. in the login window enter: Username: man24 Password: 3raRY7ja2ty





NOTES

International Scientific-Technical Conference

MANUFACTURING 2024

GENERAL CONFERENCE PROGRAM

Day 1	May 14 (Tuesday)	
Time	Event	Room/Info
10:00-14:00	Registration + Morning Coffee and Snacks	Hall 1st floor / 053
11:00-13:00	Opening Ceremony, Best Paper Awards, Keynote Speakers	CW7
13:00-13:05	Group Photo	Stairs at the back of the CW
13:05-14:00	Lunch	053
14:00-15:30	Campus & Labs Walking Tour	Start point: in front of the CW
15:30-17:00	Science & Industry & Business Discussion Panel + Coffee	053
18:30-21:00	Ice Breaker Party	MK Bowling, MM Gallery

Day 2 | May 15 (Wednesday)

Time	Event		Room/Info
09:00-10:30	Morning Coffee and Snacks	5	053
09:00-10:30	Poster Session		Hall
10:30-11:00	Coffee Break		053
11:00-12:30	Session 1.1	Session 1.2	CW7 / CW8
12:30-13:30	Lunch		053
13:30–15:00	Session 2.1	Session 2.2	CW7 / CW8
15:00-15:30	Coffee Break		053
15:30-17:00	Session 3.1	Session 3.2	CW7 / CW8
18:30-23:00	Gala Dinner (PUT)		053

Day 3 | May 16 (Thursday) Time Event Room/Info 08:30-09:00 Morning Coffee and Snacks 053 09:00-10:30 Session 4.1 Session 4.2 CW7 / CW8 Coffee Break 10:30-11:00 053 11:00-12:30 Session 5.1 Session 5.2 CW7 / CW8 12:30-13:30 Lunch 053 13:30-15:00 Session 6.1 Session 6.2 CW7/CW8 15:00-16:00 Coffee Break 053 15:00–16:00 Closing Remarks, Best Poster & Presentation Awards Ceremony 053

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