CADMD
2019

XXVII International Polish-Ukrainian Conference

CAD IN MACHINERY DESIGN IMPLEMENTATION AND EDUCATIONAL ISSUES

Conference Program

**Białystok, Poland
November 28-29, 2019**

CADMD 2019 is organized by

Faculty of Electrical Engineering
Białystok University of Technology
Poland

Department of Computer Aided Systems
Lviv Polytechnic National University
Ukraine

Faculty of Mechanical Engineering and Robotics
AGH University of Science and Technology
Poland

The Institute of Machine Design Fundamentals
Warsaw University of Technology
Poland

The CADMD 2019 is focused on the following subjects:

- Process control, identification, modeling, simulation of processes and systems.

- Methods and algorithms in CAD.

- Computer applications in engineering.

- CAD in electrical engineering: electronic devices, electrical machines, photooptics.

- Design and implementation of ECAD tools.

- CAD tools in industry 4.0.

- Power Systems and Environmental Protection Facilities.

- Robotics, mechatronics and automation.

- Microelectromechanical systems.

- Resonators, micro-optical devices, micro-fluid devices. MEMS integrated implementations.

- Information technology.

- Engineering application of informatics.

- Software, programming and algorithms, databases.

- Engineering education.

- 3D Scanning, Printing, Augmented and Virtual RealityFacilities.

International Program Committee

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prof. Andrzej Tylikowski	*Warsaw University of Technology, Poland*
prof. Maciej Zajkowski	*Białystok University of Technology, Poland*
prof. Robert Zalewski	*Warsaw University of Technology, Poland*

Local organizing group

Bogusław Butryło *Białystok University of Technology, Poland*

Agnieszka Choroszucho *Białystok University of Technology, Poland*

Marzena Koniuch *Białystok University of Technology, Poland*

Dariusz Sajewicz, PhD *Białystok University of Technology, Poland*

prof. Adam Sołbut *Białystok University of Technology, Poland*

Adam Steckiewicz *Białystok University of Technology, Poland*

prof. Maciej Zajkowski *Białystok University of Technology, Poland*

General information

Conference location

The CADMD 2019 Conference will take place at Białystok University of Technology. The CADMD 2019 conference site is building of the Faculty of Electrical Engineering. Parallel sessions will be held in two rooms on the ground floor (007 and 029)
Address of CADMD 2019 Secretariat:

Białystok University of Technology, Faculty of Electrical Engineering
ul. Wiejska 45D, 15-351 Białystok, Poland

Phone: (++48) (+85) 746 9396
E-mail: cadmd2019@pb.edu.pl
WWW pages: https://we.pb.edu.pl/cadmd2019/

Registration

The CADMD 2019 Registration Desk is placed in the hall.
The registration desk will be open for registration and information:
- Thursday, November 28   from 9.00 to 10.30 (the ground floor).
- Thursday, November 28   from 10.30 to 15.00 (room 202).
- Friday, November 29   from 9.00 to 12.00 (room 202).

Badges

The participants are kindly requested to wear their badges during conference sessions and lunches.

Any problems?

Please contact personnel at the Registration Desk or other members of the Organizing Committee, if you have any problems.
The conference staff will wear yellow badges.

Conference program at a glance

Thursday, November 28

	Room A (007)	Hall
10.00 - 10.15	**Introduction and welcome address**	
10.15 - 11.15	**Session A**	
11.15 - 11.40	**Coffee break**	
11.40 - 13.00	**Session B**	
13.00 - 13.20	**Coffee break**	
13.20 - 14.10	**Session Lenso**	
14:10 – 15:30	**Lunch**	
15.30 - 17.00	**Session C**	**Poster session A**

Friday, November 29

	Room A (007)	Hall
10.00 - 11.00	**Session D**	**Poster session B**
11.00 - 11.15	**Coffee break**	
11:15 – 12:00	**Session E**	
12:00	**Closing of the conference**	
12.30	**Lunch**	

Conference Program

Thursday, November 28

10.00 - 10.15	Room A (007)	Introduction and welcome address

- ◆ prof. Mykhailo Lobur
  Department of Computer-Aided Design Systems,
  Lviv Polytechnic National University

- ◆ prof. Mirosław Świercz
  Dean of the Faculty of Electrical Engineering,
  Białystok University of Technology

- ◆ prof. Roman Kaczyński
  Dean of the Faculty of Mechanical Engineering,
  Białystok University of Technology

10.15 - 11.15	Room A (007)	Session A: Modelling of materials and sensors Session chair: Dariusz Sajewicz, PhD

- ◆ Janusz Woźny, Ewa Raj, Nazariy Jaworski
  Analysis of graphene-like heat spreaders to p-n GaN diode

- ◆ Mykhaylo Andriychuk, Uliana Marikutsa
  Creating the materials with specific refraction coefficient

- ◆ Nazariy Jaworski, Nazariy Andrushchak
  Simulation of dispersion relations of porous composite materials
  basing on cellular microlevel structural models

- ◆ Jacek Nazdarowicz, Cezary Maj, Mariusz Jankowski, Adam Stawiński,
  Andrzej Napieralski, Michał Szermer
  Modal analysis of MEMS rotational sensors

11.15 - 11.40		Coffee break

11.40 - 13.00	Room A (007)	**Session B:** **Modelling of materials and sensors** **Session chair:** prof. Mykhailo Lobur

- Marcin Kneć
  Multitasking application of GOM ATOS 3D Scanner

- Yaroslav Sokolovskyy, Oleksiy Sinkevych
  Software for the study of physical processes of heat transfer
  anisotropic fibrous materials by using cellular automata

- Natalia Sidenko, Egils Dzelzitis
  Modelling methodology of the heat transferring process
  in the channels with fluid flow pulsation

- Oleh Matviykiv, Tamara Klymkovych, Nataliia Bokla
  Modeling and analysis of potentiometric microfluidic sensor
  for detecting heavy metals in liquids

- Yaroslav Sokolovskyy, Maryana Levkovych,
  Volodymyr Shymanskyi, Yaroslav Kaspryshyn
  Modeling of rheological behavior of materials with fractal structure
  during heat treatment

13.00 - 13.20		**Coffee break**

13.20 - 14.10	Room A (007)	**Session Lenso** **Session chair: prof. Maciej Zajkowski**

- Lenso Sp. z o.o.
  Presentation of the company and the developed software

14.10 - 15.30		**Lunch**

15.30 - 17.00	Hall	Poster session A

- Artur Prusinowski, Roman Kaczyński
  Methods of effectively forming fiber composites in Fused Deposition Modeling

- Andriy Zdobytskyi, Mykhailo Lobur, Oleh Matviykiv, Nazariy Jaworski
  Cyberphysical System of Discrete Determination of Mechanical Soil Parameter's

- Olexander Belej, Nataliia Bokla
  Modeling of a Neural Network to Determine the Position of an Object in Systems of Local Positioning on the Basis of Wireless Communication

- Mykhailo Lobur, Tadeusz Więckowski, Kamil Staniec, Serhiy Shcherbovskykh, Tetyana Stefanovych
  Developing of Graphic User Interface of Web-Oriented CAD for Reliability, Security and Safety Analysis

15.30 - 17.00	Room A (007)	Session C: Modelling of processes and materials Session chair: prof. Yaroslav Sokolovskyy

- Ivan Sokolovskyy
  Statistical modeling of fractional diffusion processes

- Mykhaylo Melnyk, Andriy Kernyskyy, Mykhailo Lobur, Andrzej Łukaszewicz
  Determination of the height of the noise source depending on the category of the vehicles

- Mykhaylo Melnyk, Andriy Kernyskyy, Yulia Vyhovska,
  Improvement of rectangular concert halls

- Ruslan Holovatskyy, Mykhailo Lobur
  Determination of boundary conditions for the radiation pattern of a microelectro-optical intelligent passive infrared motion detector

- Denys Havryliv, Maksym Semenchenko
  Defect detection on the surface of the technical ceramics using image processing and deep learning algorithms

10.00 - 11.00	Room A (007)	Session D: Modelling software Session chair: prof. Bogusław Butryło

♦ Andrzej Łukaszewicz, Roman Trochimczuk, Andriy Kernytskyy
Approach for design of mechatronics systems using CAx environment

♦ Grzegorz Mieczkowski
Estimation of strength of bolted joint performed
with the Solidworks simulation environment

♦ Viktoriia Bortnikova, Vladyslav Yevsieiev, Iryna Botsman,
Igor Nevliudov, Kostiantyn Kolesnyk
Search queries pre-processing for their classification

10.00 - 12.00	Hall	Poster session B

♦ Volodymyr Karkulovskyy, Vitaliy Mazur, Nazariy Jaworski
Method for automation of monitoring processes and maintenance
of necessary conditions for growing plants

♦ Petro Kosobutskyy, Nataliia Nestor, Nazariy Jaworski
About some inaccuracies in statistical modeling of random data

♦ Krzysztof Pytel, Uliana Marikutsa, Dmitrij Korpyljov,
Roman Panchak, Mykola Medykovskyi
Development of remote environmental monitoring module

♦ Danylo Strus, Mariia Orynchak, Uliana Marikutsa, Marian Banaś
Research and design of the recommendation subsystem for transport
geo-situational routes of the city

11.00 - 11.30		**Coffee break**

11.20 - 12.00	Room A (007)	Session E: Software and implementations Session chair: prof. Mykhaylo Melnyk

♦ Nikolay Kiktev
Distributed information system for calculation and optimization
of fodder production based on MySQL database

♦ Sergii Surkov
Model of memory consumption for HTTP authorization protocols
with verification of payload

12.00		**Closing of the conference**

12.30		**Lunch**

ARAMIS

Bezkontaktowy i niezależny od materiału system pomiarowy oparty na cyfrowej korelacji obrazów. Stanowi on stabilne rozwiązanie do analizowania metodą pełnego pola i metodą punktową przedmiotów o wymiarach od kilku milimetrów do elementów konstrukcyjnych o wielkości kilku metrów.

TRITOP

Przenośny system służący do szybkich i precyzyjnych pomiarów współrzędnych trójwymiarowych obiektów.

ARGUS

System analizy formowania ARGUS wspiera optymalizację procesu formowania blach, uwzględniając prawidłowy dobór materiału i optymalizację narzędzi.

PONTOS LIVE

Mobilny optyczny system pomiarowy 3D do pomiarów fotogrametrycznych online. PONTOS Live to system śledzenia firmy GOM umożliwiający pozycjonowanie komponentów, na przykład do precyzyjnego dopasowania maszyn CNC lub do regulacji zamocowań. W połączeniu z sondą stykową GOM, system PONTOS Live umożliwia kontrolę miejsc trudno dostępnych optycznie.

LENSO SP. Z O.O. JEST WYŁĄCZNYM DYSTRYBUTOREM OPTYCZNYCH SYSTEMÓW POMIAROWYCH FIRMY GOM W POLSCE. DOŚWIADCZONY I KOMPETENTNY ZESPÓŁ INŻYNIERÓW, ZAPEWNIA POMOC PRZY DOBORZE ODPOWIEDNIEGO SYSTEMU POMIAROWEGO, PREZENTACJE MASZYN, WDROŻENIA I SUPPORT.

SPRZEDAŻ SYSTEMÓW POMIAROWYCH

Wykonujemy prezentacje systemów pomiarowych firmy GOM w naszej siedzibie w Poznaniu lub na miejscu u Klienta. Zapewniamy dobór odpowiedniej maszyny pomiarowej do konkretnej aplikacji i zastosowania.

WDROŻENIE I SZKOLENIA

Przeprowadzamy pełny proces instalacji i wdrożenia systemów pomiarowych w polskim przemyśle, uczelniach i jednostkach badawczych. Wykwalifikowani pracownicy wykonują również szkolenia z obsługi maszyn pomiarowych oraz oprogramowania do analizy wymiarowej firmy GOM.

POMOC TECHNICZNA

Zapewniamy pełne wsparcie techniczne dla naszych produktów za pośrednictwem poczty e-mail czy rozmowy telefonicznej. Pomagamy w aplikacjach i wdrożeniach optycznych maszyn pomiarowych. Prowadzimy serwis gwarancyjny i pogwarancyjny.

CENTRUM KOMPETENCJI METROLOGICZNYCH

NASZĄ MISJĄ JEST ZAGWARANTOWANIE DOSTĘPU PRZEDSIĘBIORSTWOM PRZEMYSŁOWYM, PRAKTYCZNIE KORZYSTAJĄCYM Z METROLOGII I KONTROLI JAKOŚCI W SWOJEJ DZIAŁALNOŚCI, DO OGÓLNOŚWIATOWEJ PLATFORMY INTEGRUJĄCEJ PROFESJONALNYCH DOSTAWCÓW TOWARÓW I USŁUG W ZAKRESIE METROLOGII I KONTROLI JAKOŚCI. CELEM JEST UMOŻLIWIENIE CAŁKOWITEGO, KOMPLEKSOWEGO I FACHOWEGO ZABEZPIECZENIA WSZELKICH POTRZEB PRZEDSIĘBIORSTW PRZEMYSŁOWYCH W ZAKRESIE METROLOGII I KONTROLI JAKOŚCI.

DO CENTRUM KOMPETENCJI METROLOGICZNYCH NALEŻĄ

LENSO   **3D**TEAM   **3D**TOOL

DO CENTRUM KOMPETENCJI METROLOGICZNYCH NALEŻĄ

3D SYSTEMS   **gom**   **WITTE**

WWW.CENTRUMMETROLOGICZNE.PL
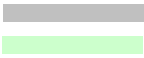
Maps

City of Białystok

1	Campus of Białystok Technical University, Conference site
2	Campus of Białystok Technical University, Student hostel
3	Pastel Hotel
4	Zwierzyniec Hotel
5	Best Western Hotel Cristal
6	Branicki Hotel
7	Energetyk Hotel
8	Titanic Hotel
9	Gołębiewski Hotel
R	Railway Station
B	Bus station
🏛	Museum
🎭	Theatre, Cinema, Philharmonic
▲	Monument
H	Hotel
🍴	Restaurant

Conference centre

ul. Zwierzyniecka

← 8, 10, 17, 26 →

CE
CE
α
β
γ
δ
H
M
G1
EE
ME
ME
CS/CE
CE
R
CS
T
G2

to city

← 3, 6, 16, 17, 19, 102 →

ul. Mazowiecka

ul. Wiejska

← 8, 11, 17, 23 →

ul. Kopernika

← 6, 19, 23, 27 →

← 3, 10, 16, 26, 27, 102 →

N
S

© BP

to bus and railway station

CE	Faculty of Civil Engineering and Environmental Engineering
CS	Faculty of Computer Science
EE	Faculty of Electrical Engineering, Conference center
G1, G2	Gym hall
H	Assistant Hostel
M	Students' club and canteen
ME	Faculty of Mechanical Engineering
R	Rector's Office
T	Tennis-court
α, β, γ, δ	Student Hostel
B	Bus stop
P	Parking area
▬▬	Internal roads and main paths

Information for participants

Duration of presentations

Regular paper   15 min., maximum 20 min. including discussion
Poster   min. 1 hour

Form of presentations

The presentation can be performed by using an electronic version or with transparencies. For the computer aided presentation the Microsoft Powerpoint and Acrobat Reader are available.

Uploading of presentation

The lecturers are encouraged to use the computer provided by organizers. The usage of the own computer for the presentation is undesirable.
In order to use the computer available in the conference room, the presentation must be written down to the local computer.

Technical equipment

The conference room is equipped with:
- LCD projector,
- computer.

The computers in conference rooms are running with MS Windows operating system.

Meals

Lunches on Thursday and Friday will be served in the "Hotel Pod Herbem", which is close to the conference site.

Every participant receives some luncheon tickets. The participants are kindly requested to show and deliver the ticket to the operating personnel of the canteen.