



WARSAW UNIVERSITY OF TECHNOLOGY  
Faculty of Geodesy and Cartography



UNIVERSITY OF WARMIA AND MAZURY  
IN OLSZTYN  
Faculty of Geoengineering



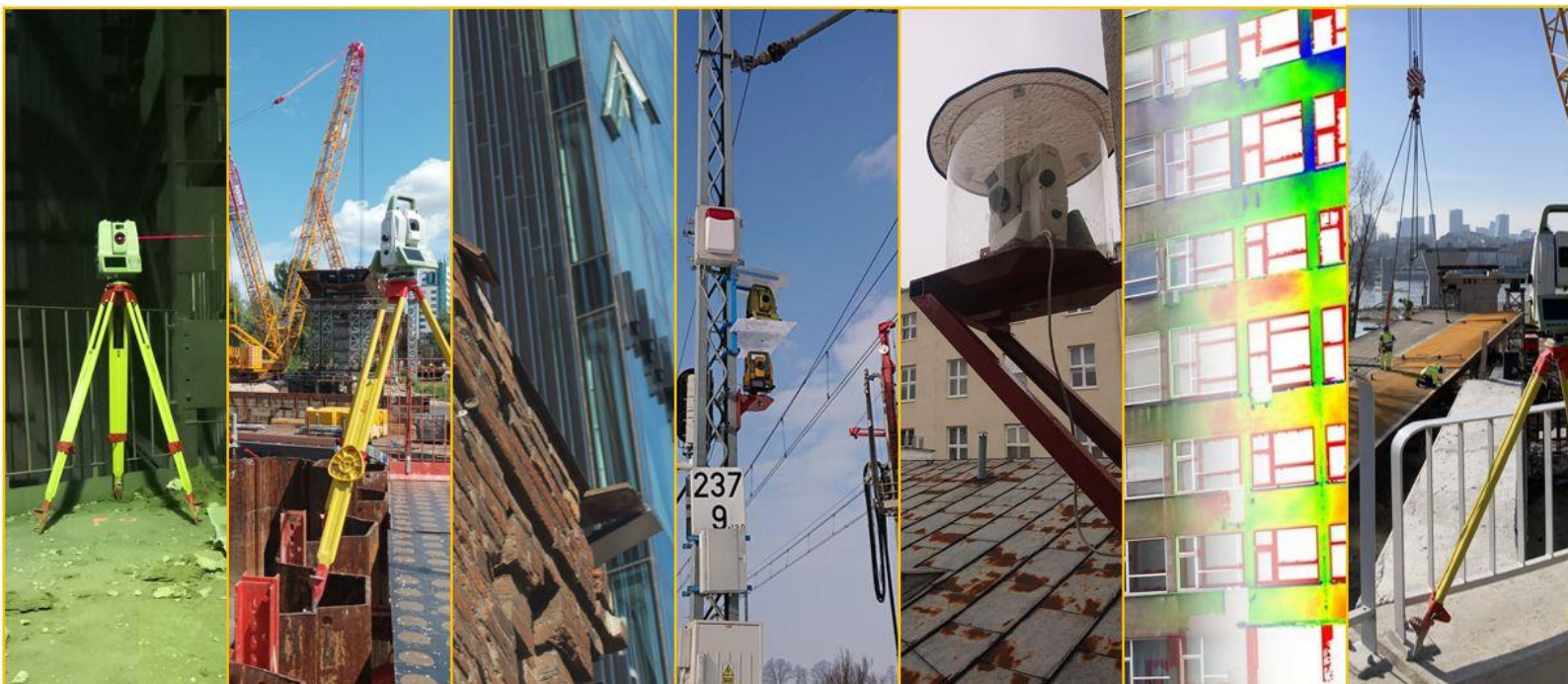
ASSOCIATION OF POLISH SURVEYORS  
Section of Engineering Geodesy

## **XVII International Science and Technology Conference CURRENT PROBLEMS IN ENGINEERING SURVEYING**

**New challenges for engineering surveying  
in civil engineering and environmental monitoring**



### **CONFERENCE PROGRAM**



**Warsaw – Józefostów, 22-23 May 2025**



## **SCIENTIFIC COMMITTEE**

Prof. Kazimierz Bęcek – Wrocław University of Science and Technology, Poland  
Prof. Sławomir Cellmer – University of Warmia and Mazury in Olsztyn, Poland  
Prof. Maria Mrówczyńska – University of Zielona Góra, Poland  
Prof. Hans-Berndt Neuner – Vienna University of Technology, Austria  
Prof. Edward Nowak – Warsaw University of Technology, Poland  
Prof. Karol Prałat – Warsaw University of Technology, Poland  
Prof. Witold Prószyński – Warsaw University of Technology, Poland  
Prof. Bogdan Wolski – Kielce University of Technology, Poland  
Assoc. prof. Robert Duchnowski – University of Warmia and Mazury in Olsztyn, Poland  
Assoc. prof. Jan Kapłon – Wrocław University of Environmental and Life Sciences, Poland  
Assoc. prof. Kamil Kowalczyk – University of Warmia and Mazury in Olsztyn, Poland  
Assoc. prof. Karol Kowalski – Warsaw University of Technology, Poland  
Assoc. prof. Marcin Ligas – AGH University of Krakow, Poland  
Assoc. prof. Tomasz Lipecki – AGH University of Krakow, Poland  
Assoc. prof. Andrzej Pachuta – Warsaw University of Technology, Poland  
Assoc. prof. Jacek Paziewski – University of Warmia and Mazury in Olsztyn, Poland  
Assoc. prof. Dariusz Popielarczyk – University of Warmia and Mazury in Olsztyn, Poland  
Assoc. prof. Paweł Popielski – Warsaw University of Technology, Poland  
Assoc. prof. Jacek Rapiński – University of Warmia and Mazury in Olsztyn, Poland  
Assoc. prof. Zbigniew Siejka – University of Agriculture in Krakow, Poland  
Assoc. prof. Rafał Sieradzki – University of Warmia and Mazury in Olsztyn, Poland  
Assoc. prof. Michał Strach – AGH University of Krakow, Poland  
Assoc. prof. Marek Woźniak – Warsaw University of Technology, Poland  
Assoc. prof. Ireneusz Wyczątek – Bydgoszcz University of Science and Technology, Poland  
Assoc. prof. Janina Zaczek-Peplinska – Warsaw University of Technology, Poland  
Doc. dr. Aleš Marjetič – University of Ljubljana, Slovenia  
PhD Patrycja Wyszowska – University of Warmia and Mazury in Olsztyn, Poland

## **ORGANIZING COMMITTEE**

Assoc. prof. Robert Duchnowski – University of Warmia and Mazury in Olsztyn, Poland  
Assoc. prof. Jacek Paziewski – University of Warmia and Mazury in Olsztyn, Poland  
Assoc. prof. Rafał Sieradzki – University of Warmia and Mazury in Olsztyn, Poland  
PhD habil. Nataliya Kablak – Warsaw University of Technology, Poland  
PhD Sławomir Jastrzębski – Warsaw University of Technology, Poland  
PhD Waldemar Odziemczyk – Warsaw University of Technology, Poland  
PhD Katarzyna Stępnia – University of Warmia and Mazury in Olsztyn, Poland  
PhD Patrycja Wyszowska – University of Warmia and Mazury in Olsztyn, Poland  
MSc Iwona Jankowska – Warsaw University of Technology, Poland  
MSc Krzysztof Książek – Warsaw University of Technology, Poland



## CONFERENCE TOPICS

1. Sensors and integrated measurement systems in engineering surveying
2. New algorithms and data processing techniques – time series analysis, deformation modeling, machine learning, reliability, statistical testing, big data
3. Geodetic and structural health monitoring of engineering and construction structures
4. Engineering surveying in the civil engineering and mining industry
5. Modern surveying technologies – GNSS, LiDAR, UAV, InSAR, photogrammetry, bathymetry, GPR, EDM, total station
6. Early warning systems and engineering measurements in risk management
7. BIM – modeling and information management on engineering objects, digital twins
8. Surveying techniques in geotechnics and geoengineering
9. Low-cost measurement systems
10. Reference systems

## PATRONAGES



Surveyor General of Poland



Rector of the Warsaw University of Technology



Rector of the University of Warmia and Mazury in Olsztyn



Polish Chamber of Civil Engineers



Editorship of monthly journal Przegląd Geodezyjny



Editorship of the Geoforum.pl portal



Reports on Geodesy and Geoinformatics



## CONFERENCE PROGRAM

Thursday 22 May 2025	
10:00-11:15	<b>REGISTRATION</b>
11:15-11:30	<b>OPENING CEREMONY</b>
11:30-13:00	<b>SESSION I – ALGORITHMS &amp; DATA PROCESSING METHODS</b> Chairs: Robert Duchnowski, University of Warmia and Mazury in Olsztyn, Poland Tomasz Lipecki, AGH University of Krakow, Poland <ol style="list-style-type: none"> <li>1. <i>A New Concept for Verification and Calibration of Active and Passive Measurement Systems: One-Stop-Lab CENAGiS</i>  <u>Śławomir Łapiński</u>, Jakub Markiewicz            Warsaw University of Technology, Poland</li> <li>2. <i>On the Feasibility of Precise Vibration Detection Based on the Fusion of Low-Cost GNSS and MEMS Accelerometer</i>  <u>Jacek Paziewski</u>, Rafał Sieradzki, Radostaw Baryła, Katarzyna Stępnia, Dariusz Tomaszewski, Jakub Kościelski, Hubert Szczepanik            University of Warmia and Mazury in Olsztyn, Poland</li> <li>3. <i>Application of the Simulated Annealing Algorithm for Identification of the Constant Reference Points in 3D Deformation Analysis</i>  <u>Waldemar Odziemczyk</u>            Warsaw University of Technology, Poland</li> <li>4. <i>The Role of Geodetic Measurement Results in FEM Analyses of Building Objects on Deforming Ground</i>  <u>Łukasz Kapusta</u>            Kielce University of Technology, Poland</li> <li>5. <i>Observation Processing Techniques for Generating 2.5D Building Models Using Machine Learning and Monoscopic Satellite Imagery</i>  <u>Kamil Grudzień</u>            KPGeo Sp. z o.o., Krakow, Poland</li> </ol>
13:00-14:00	<b>LUNCH BREAK</b>
14:00-15:30	<b>SESSION II – APPLICATIONS &amp; NEW CONCEPTS</b> Chairs: Janina Zaczek-Peplinska, Warsaw University of Technology, Poland Jacek Paziewski, University of Warmia and Mazury in Olsztyn, Poland <ol style="list-style-type: none"> <li>1. <i>Cave Mapping with Autonomous Laser Scanning Module</i>            Bence Péter Hrutka, <u>Bence Takács</u>            Budapest University of Technology and Economics, Hungary</li> <li>2. <i>Potential and Limitations of LiDAR for Monitoring Reclaimed Landfill Deformation</i>  <u>Grzegorz Pasternak</u><sup>1</sup>, Janina Zaczek-Peplinska<sup>2</sup>  <sup>1</sup> Warsaw University of Life Sciences, Poland  <sup>2</sup> Warsaw University of Technology, Poland</li> </ol>



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	<p>3. <i>Evaluation of the Suitability of the Static GNSS Method for the Surveying of Multi-Storey Buildings</i>  <u>Karol Krawczyk</u>  Kielce University of Technology, Poland</p> <p>4. <i>The Problem of Resuming the Construction Axes During the Expansion of the Building by an Additional Floor</i>  <u>Justyna Paszek</u>, Dominika Reder  Silesian University of Technology, Gliwice, Poland</p> <p>5. <i>Accuracy Assessment of Low-Cost GNSS Observations for Displacement Monitoring</i>  <u>Katarzyna Stępnia</u>k, Jacek Paziewski, Rafał Sieradzki, Hubert Szczepanik, Jakub Kościelski  University of Warmia and Mazury in Olsztyn, Poland</p> <p>6. <i>On the Applicability of Smartphones to Structural Health Monitoring</i>  <u>Rafał Sieradzki</u>, Jacek Paziewski  University of Warmia and Mazury in Olsztyn, Poland</p>
<b>15:30-16:00</b>	<b>COFFEE BREAK</b>
<b>16:00-17:00</b>	<b>POSTER SESSION</b>
	<p>Chairs: Rafał Sieradzki, University of Warmia and Mazury in Olsztyn, Poland  Ireneusz Wyczątek, Bydgoszcz University of Science and Technology, Poland</p> <p>1. <i>Cm accurate transformation to the Hungarian EOV</i>  <u>Zoltán Siki</u>, Sándor Tóth, Bence Takács  Budapest University of Technology and Economics, Hungary</p> <p>2. <i>Framework for Combining Remote Sensing Techniques and Decision Support System for Multi-Risk Assessment of Post-Mining Sites</i>  <u>Vinicius Inojosa</u>  Technische Hochschule Georg Agricola University, Bochum, Germany</p> <p>3. <i>Application of Own-Developed GNSS Antenna Vibration Simulator to Validate Dynamic Displacement Detection Systems</i>  <u>Radosław Baryła</u>, Jacek Paziewski  University of Warmia and Mazury in Olsztyn, Poland</p> <p>4. <i>Feature Data Acquisition for Large-Scale Maps of Investment Area</i>  <u>Adam Dorskoc</u>  University of Warmia and Mazury in Olsztyn, Poland</p> <p>5. <i>Application of Terrestrial Laser Scanning Technology for Wind Turbine Blade Defect Detection</i>  <u>Paulina Stałowska</u>, Czesław Suchocki, Adam Zagubień  Koszalin University of Technology, Poland</p> <p>6. <i>Environmental Research Applications of Global Navigation Satellite Systems (GNSS) and Synthetic Aperture Radar (SAR): Water Resources and Hydrology Approach</i>  <u>Rokas Bražiūnas</u>, Jūratė Sužiedelytė-Visockienė  Vilnius Gediminas Technical University, Lithuania</p>





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	<p>7. <i>Time Series Processing Using Deep Learning</i>  <u>Zoltán Siki</u>          Budapest University of Technology and Economics, Hungary</p> <p>8. <i>Laser Scanning Data Processing Using <math>M_{split}</math> Estimation and Sliding Window Algorithm</i>          Robert Duchnowski, <u>Patrycja Wyszowska</u>          University of Warmia and Mazury in Olsztyn, Poland</p> <p>9. <i>Spatiotemporal Analysis of Displacements of Concrete Tank Segments During Assembly Works</i>  <u>Kinga Wawrzyniak</u><sup>1</sup>, Zbigniew Muszyński<sup>1</sup>, Jakub Szczepański<sup>2</sup>, Ciechośław Patrzalek, Czesław Bywalski<sup>1</sup>  <sup>1</sup> Wrocław University of Science and Technology, Poland  <sup>2</sup> Wrocław University of Environmental and Life Sciences, Poland</p> <p>10. <i>Application of Terrestrial Laser Scanning and Inclinometer for Comprehensive Monitoring of Deep Excavation</i>  <u>Zbigniew Muszyński</u>, Marek Wyjadłowski, Paulina Kujawa, Karolina Gorska          Wrocław University of Science and Technology, Poland</p> <p>11. <i>Graphical Programming Environment for Prototyping Structural Health Monitoring Systems Using Low-Cost Sensors</i>  <u>Milan Witek</u>          AGH University of Krakow, Poland</p> <p>12. <i>Smartphone Precise Positioning with MAFA Method – Preliminary Results</i>          Dawid Kwaśniak, Marcin Uradziński          University of Warmia and Mazury in Olsztyn, Poland</p> <p>13. <i>Application of Artificial Intelligence and Machine Learning in the Automatization of Geodetic and Geotechnical Monitoring – a Review of Research Directions and Practical Examples</i>  <u>Maria Elżbieta Kowalska</u>, Janina Zaczek-Peplinska          Warsaw University of Technology, Poland</p>
18:00	<b>DINNER (BARBECUE)</b>



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Friday 23 May 2025	
8:30-9:30	<b>MEETING OF SECTION OF ENGINEERING GEODESY OF ASSOCIATION OF POLISH SURVEYORS – ZEBRANIE SEKCJI GEODEZJI INŻYNIERYJNEJ SGP (IN POLISH)</b>
9:30-10:45	<b>SESSION III – SYSTEMS &amp; MULTI-SENSOR DATA INTEGRATION</b>
	Chairs: Zbigniew Muszyński, Wrocław University of Science and Technology, Poland Zoltán Siki, Budapest University of Technology and Economics, Hungary
	<ol style="list-style-type: none"> <li><i>Integration of Multi-Source Data Using the TLS-SfM Approach for Multi-Temporal Investigation of Cultural Heritage Objects</i>  <u>Jakub Markiewicz</u><sup>1</sup>, Agnieszka Bocheńska<sup>2</sup>, Patryk Kot<sup>3</sup>, Sławomir Łapiński<sup>1</sup>, Dorota Zawieska<sup>1</sup>, Magomed Muradov<sup>4</sup>  <sup>1</sup> Warsaw University of Technology, Poland  <sup>2</sup> Archaeology Department the Royal Castle in Warsaw, Poland  <sup>3</sup> Infection Innovation Technology Laboratory (iiTECH), Infection Innovation Consortium (iiCON), Liverpool School of Tropical Medicine, United Kingdom  <sup>4</sup> BEST Research Institute Liverpool John Moores University, United Kingdom</li> <li><i>The Data Integration for Multi-Temporal Conservation Works – Image and Range-Based Approaches</i>  <u>Jakub Markiewicz</u><sup>1</sup>, <u>Sławomir Łapiński</u><sup>1</sup>, Dorota Zawieska<sup>1</sup>, Katarzyna Górecka<sup>2</sup>  <sup>1</sup> Warsaw University of Technology, Poland  <sup>2</sup> Academy of Fine Arts in Warsaw, Poland</li> <li><i>Integrating Laser Scanning, BIM, and Gaming Technologies for Monitoring and Restoration of Historical Structures</i>  <u>Krzysztof Karsznia</u><sup>1</sup>, Hanniel Tetteh Djaba<sup>2</sup>  <sup>1</sup> Warsaw University of Technology, Poland  <sup>2</sup> Geopartner Gdańsk, Poland</li> <li><i>Assessing Historic Structure Vulnerability to Extreme Precipitation: a Multi-Disciplinary Data Integration Study</i>  <u>Krzysztof Książek</u>, Krzysztof Karsznia, Waldemar Odziemczyk, Ewa Joanna Świerczyńska          Warsaw University of Technology, Poland</li> </ol>
10:45-11:15	<b>COFFEE BREAK</b>
11:15-12:45	<b>SESSION IV – CASE STUDIES</b>
	Chairs: Nataliya Kablak, Warsaw University of Technology, Poland Michał Strach, AGH University of Krakow, Poland
	<ol style="list-style-type: none"> <li><i>Photovoltaic Farm Diagnostics Using UAVs: Defect Detection Analysis</i>  <u>Michał Strach</u>          AGH University of Krakow, Poland</li> <li><i>Research on the Quality of Photogrammetric Development of Cartographic Products for Architectural Monuments on the Example of the Bierzgłowski Castle Complex</i>  <u>Adam Bujarkiewicz</u>, Ireneusz Wyczątek, Marcin Lewandowski          Bydgoszcz University of Science and Technology, Poland</li> </ol>



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	<p>3. <i>The Influence of Training Datasets from TLS and UAV in Machine Learning Models on Stability Assessment of Historical Objects – a Case Study of the Castle in Bedzin, Poland</i>  <u>Ewa Joanna Świerczyńska</u><sup>1</sup>, Krzysztof Karsznia<sup>1</sup>, Waldemar Odziemczyk<sup>1</sup>, Krzysztof Książek<sup>1</sup>, Jacek Sztubecki<sup>2</sup>, Małgorzata Sztubecka<sup>2</sup>  <sup>1</sup> Warsaw University of Technology, Poland  <sup>2</sup> Bydgoszcz University of Science and Technology, Poland</p> <p>4. <i>The Metrological Evaluation of Range-Based Sensors Utilised the VDI/VDE CENAGiS Standard</i>            Jakub Markiewicz, Sławomir Łapiński, Michał Kowalczyk            Warsaw University of Technology, Poland</p> <p>5. <i>Evaluating Mobile Laser Scanning Accuracy and Applicability for HBIM Construction in the Historic Monastic Complex in Sieciechów, Poland</i>  <u>Krzysztof Karsznia</u>, Krzysztof Książek, Nataliya Kablak            Warsaw University of Technology, Poland</p> <p>6. <i>Problems of determining reference systems in inclinometric measurements</i>  <u>Lech Saloni</u><sup>1</sup>, Łukasz Piasta<sup>1</sup>, Sławomir Łapiński<sup>2</sup>  <sup>1</sup> GEOalpin sp. z o.o., Warsaw, Poland  <sup>2</sup> Warsaw University of Technology, Poland</p>
<b>12:45-13:00</b>	<b>CLOSING CEREMONY</b>
<b>13:00-14:00</b>	<b>LUNCH BREAK</b>