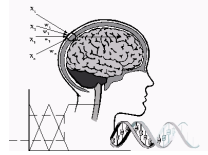# *International*

Innovation in Knowledge Based and Intelligent Engineering Systems

INVITED SESSION SUMMARY

Title of Session:

Artificial Intelligence in Industry and Humanoid Robotics

Name, Title and Affiliation of Chair:

Prof. **Maciej Majewski**
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Faculty of Computer Science
Department of Applied Informatics and Artificial Intelligence
Gdynia Maritime University, Poland

Prof. **Maciej Zawodniok**
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Intelligent Systems Center
Electrical and Computer Engineering Department
Missouri University of Science and Technology, USA

Prof. **Ireneusz Czarnowski**
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Department of Applied Informatics and Artificial Intelligence
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Details of Session (including aim and scope):

This invited session explores the integration of artificial intelligence methods in industrial automation systems and humanoid robotics applications. The session brings together researchers working on AI-driven intelligent systems for diverse environments including factories, offices, healthcare facilities, homes, public spaces, smart cities, smart buildings, and intelligent infrastructures where humanoid robots and autonomous systems operate.

Scope:
The session addresses AI methods including cognitive architectures, machine learning, knowledge-based systems, computer vision, natural language processing, and multi-agent coordination. Applications span industrial automation, cyber-physical systems, autonomous robotics, service robotics, healthcare, education, entertainment, and human-robot collaboration in various domains.

Topics of interest include:
- **Language Models and Communication:** Large language models for robotics, multimodal AI systems, natural language interaction and dialogue, vision-language models for robot understanding.
- **Humanoid Robotics and Human-Robot Interaction:** Cognitive architectures for humanoid robots, social robotics and affective computing, natural language interaction and dialogue systems, physical human-robot collaboration and safety, service and domestic assistant robots, motion planning and adaptive control.
- **AI for Industrial Automation:** Machine learning for predictive maintenance and optimization, cyber-physical systems and digital twins, Industrial IoT and edge computing, autonomous systems in industrial environments, multi-agent coordination.
- **Cross-Domain AI Methods:** Computer vision and sensor fusion for robotics, knowledge representation and reasoning, context-aware adaptive systems, reinforcement and deep learning architectures, explainable AI for robotic systems.

- **Applications and Implementation:** Healthcare and assistive robotics, educational and entertainment applications, smart cities and intelligent infrastructures, real-time control systems, case studies and benchmarking.

The session welcomes theoretical contributions, experimental studies, and case studies demonstrating AI integration in humanoid robotics and industrial intelligent systems.

Main Contributing Researchers / Research Centres (tentative, if known at this stage):

Gdynia Maritime University, Poland

Missouri University of Science and Technology, USA

Website URL of Call for Papers (if any):

Email & Contact Details:

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