APPLIED ARTIFICIAL INTELLIGENCE 2026. EDITORIAL*

The European Research Group on Artificial Intelligence, EURGAI, is responsible for theoretical and applied research in Artificial Intelligence and organized the ISCAAI 2026 – International Scientific Conference on Applied Artificial Intelligence in Szeged, Hungary on January 26, 2026. The issue articles were presented on ISCAAI 2026 conference, authors come from 6 countries: Hungary, Serbia, Bosnia and Herzegovina, Italy, Sweden and Ukraine. The research results in this journal include the following ten articles, which were refereed prior to their acceptance for publishing:

The article *From sensors to Decisions: AI's Impact on Autonomous Vehicle Perception*, by Jelena Pisarov and Gyula Mester.

> The primary aim of this research is to evaluate the "Perception-to-Decision" pipeline, specifically focusing on how Artificial Intelligence (AI) integrates multi-modal sensory data to create a resilient cognitive framework for Level 5 autonomy. The results of this study demonstrate that while individual sensors possess inherent physical limitations – such as camera sensitivity to glare or LiDAR's degradation in heavy precipitation – AI-driven sensor fusion significantly mitigates these vulnerabilities by cross-referencing data streams to reduce environmental uncertainty.

The article titled *Explainable Machine Learning for Patient Satisfaction Prediction in Healthcare: a Regression and Classification Study*, by Milica Tufegdžić, Đorđe Mirjanić, Predrag Dašić and Nevena Tufegdžić.

> This study evaluated regression and classification models for predicting AI diagnostic confidence and patient satisfaction in healthcare using a synthetic dataset of 5 000 patients with 23 variables generated through clinically informed rules. Linear Regression, Support Vector Regression, Random Forest, Hist Gradient Boosting, eXtreme Gradient Boosting, Light Gradient Boosting Machine, and CatBoost were tested for regression to estimate the target variable AI_Diagnosis_Confidence.

The article *Transforming Academic Library Workflows with Artificial Intelligence: Bibliometric Analysis and Mini-Review*, by László Berek.

> This study first conducts a bibliometric analysis to evaluate the current situation of AI adoption in university libraries confronted with enduring challenges, focusing on publication trends and geographic and subject-area distributions. Based on these findings a mini-review is presented that closely scrutinizes 34 selected publications indexed by Scopus. These sources are of different study designs, settings and methods and collectively investigate the transformation of information retrieval and cataloguing processes in university libraries by AI.

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The article titled *Artificial Intelligence-Enabled Industrial Automation: a Comparative Study of Leading Industries and Global Robotics Adoption*, by Isak Karabegović, Ermin Husak, Gyula Mester and Predrag Dašić,

> aims to analyse the dynamics of industrial robot implementation in two strategically important sectors – the automotive and the electrical/electronic industries – at the global level. Special attention is given to five leading countries in terms of robot density over the past decade: Japan, South Korea, Germany, China, and the United States. Through a comparative analysis based on statistical data from relevant sources (such as the International Federation of Robotics, industry reports, and papers indexed in WoS and Scopus databases), the study explores key trends, strategies, and technologies that have enabled these countries to become global leaders in industrial robotics. The results indicate that the automotive industry remains the most significant sector for robot deployment, with a high concentration of robots in welding, assembly, and painting operations.

The article *Embracing the Synergy of Artificial Intelligence with Lean and Six Sigma Methodologies*, by Janos Santa and Gyula Mester.

> Synergies between Six Sigma and Lean methodologies exist even without including any support from Artificial Intelligence. As the complexity of the tasks performed by artificial Intelligence are more deepened with this current article we tested successfully some part of the Six Sigma Methodologies. The intention was to prove that even these well-known optimization processes which until now were working well with old digitalization solutions can be improved further by instructing Artificial Intelligence to run the process steps. Lean and Six Sigma are two methodologies using each other synergies to optimize processes by elimination of waste. While Six Sigma is focusing on reduction of variations, Lean is focusing on optimization by reduction of waste. Combining them provides a powerhouse approach that makes processes both fast and high quality.

The article *Mathematical Formalisation of Emergent Behaviour in Digital Twins of Manufacturing Systems*, by Sergiy V. Kovalevskyy,

> proposes a mathematical framework for analysing emergent behaviour in digital twins of manufacturing systems. The digital twin is modelled as a dynamic network of interacting subsystems described by a system of differential equations. An entropy-based emergence index is introduced to quantify collective complexity. Two stability theorems and one optimality theorem are formally proved. A variational Principle of Minimum Emergent Complexity is formulated, linking information-theoretic complexity directly to manufacturing efficiency. Numerical simulations with four scientific figures confirm the theoretical predictions. The proposed formalisation provides a foundation for intelligent control in Industry 5.0 environments.

The article titled *Teaching, Research and Application of AI at Belgrade Metropolitan University*, by Dragan. S. Domazet and Jovana Lj. Jović,

states aim and strategy of applying GenAI in education, research and university operations at Belgrade Metropolitan University (BMU). A list of 15 AI courses currently being studied at BMU is given. Current R&D activities on use of generative AI in learning materials preparation, students learning, rating of student's assignments, and in management of university operations are listed. In conclusion, it is stated that it is necessary for students to master the application of GenAI due to the needs of their future employers, but that their understanding of what the GenAI offers them must be checked. GenAI provides efficiency and quality of education, but it is necessary to adapt the regulation to the possibilities of GenAI application in education.

The article *Artificial Intelligence in Interdisciplinary Synesthetic Sound and Video Design Project*, by Ivan Lj. Kljajić, Mirko R. Jankov, Danijela V. Toljaga-Nikolić and Nikola J. Kuzmanović,

explores how the music production processes and the artificial intelligence (AI) tools can be integrated within interdisciplinary artistic projects based on artistic synaesthesia. The research is grounded in the Enitur zeb principle developed through artistic practice, where visual artworks serve as the conceptual source for the creation of original sound compositions. It is analysed how a structured project management approach can support the development of complex multimedia artworks combining sound, image, and AI technologies. The study concludes that the synergy between project management, artificial intelligence, and music production represents a promising framework for future interdisciplinary artistic research.

The article titled *The Role of Multidisciplinary Expertise in AI Training Data: Quantifying Variability in Prostate and Urethral MRI Segmentation*. It is written by Szilvia Totin, Andras Negyessy, William Holmlund, Attila Simko, Istvan Elod Kiraly, Adam Hodoniczki, Benedek Danka, Eniko Koos, Viktor Rogowski, Christian Jamtheim Gustafsson, Miklos Zrinyi, Angelika Szatmari, Peter Palasti, Linda Varga, Tufve Nyholm, Zoltan Bajory and Zsuzsanna Fejes.

The study confirms that professional background and experience levels significantly influence the precision of prostate and urethral segmentation, yet these variations remain within clinically acceptable limits when standardized protocols are applied. The identified 3,3-3,7 mm specialty-specific bias between radiologists and urologists in urethral localization highlights the necessity for multi-disciplinary consensus in defining "ground truth" for AI training.

The article *Critical Artificial Intelligence Validation in Autonomous Vehicles – Reconstruction of Decision Logic and Risk Analysis*, by Laszlo Ady, Péter János Varga, György Schuster and Dániel Tokody.

The integration of AI into Autonomous Vehicles (AVs) presents a paradigm shift in transportation, promising enhanced safety and efficiency. However, the inherent complexity and "black-box" nature of many AI models, particularly deep learning systems, pose unprecedented challenges for safety validation and certification. This article addresses the critical need for reconstructing the decision logic of AV AI systems

systems to enable rigorous quantitative risk analysis. This article concludes that the proposed quantitative framework is a vital step toward standards-compliant, safe, and justifiable deployment of autonomous driving technology.

All the presented articles provide the careful studies of the Applied Artificial Intelligence, and the editor believes that the whole issue is a very interesting read.

Cordially,

Szeged, 26th July 2026

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