



Book of Abstracts

**The Fifth Serbian International
Conference on Applied Artificial
Intelligence (SICAAI)**

May 20-21, 2026, Kragujevac, Serbia

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**The Fifth Serbian International Conference on Applied Artificial Intelligence,
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Publisher

University of Kragujevac, Serbia

Press

Izdavačko Preduzeće Epoha DOO Požega

Impression

100 copies

Year of publication

2026

ISBN- 978- 86-81037- 93-5

CIP - Каталогизација у публикацији Народна библиотека Србије, Београд

004.8(048)

SERBIAN international conference on applied artificial intelligence (5 ; 2026 ; Kragujevac)

Book of Abstracts / The Fifth serbian international conference on applied artificial intelligence (SICAAI), may 20-21, 2026, Kragujevac, Serbia ; [editor Nenad Filipović]. - Kragujevac : University of Kragujevac, 2026 (Požega : Epoha). - 100 str. : fotogr. ; 30 cm

Tiraž 100. - Str. 5: Welcome message / Nenad Filipović.

ISBN 978-86-81037-93-5

a) Вештачка интелигенција -- Примена -- Апстракти

COBISS.SR-ID 193602057

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- Bioengineering Research and Development Center (BIOIRC)
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Welcome Message

Dear colleagues and students,

On behalf of the Organizing Committee, it is a pleasure to welcome you at the Fifth Serbian International Conference on Applied Artificial Intelligence (AAI2026) which takes place at Kragujevac, Serbia, on May 20th-21st, 2026.

AAI2026 provides an exceptional Serbian and international forum to share the state-of-the-art research knowledge and results on the innovative theories, methodology and applications of artificial intelligence and its sub-domain like deep learning, machine learning in different areas such as medicine, economy, education, law, smart city, government, industry etc. Moreover, the conference aims to provide a platform for researchers and practitioners for both academia and industry to share the information about cutting-edge developments in the field of artificial intelligence.

It also aims to:

- provide early-stage researchers with an inspiring event allowing them to connect to relevant experts in related fields;
- provide an exciting venue for researchers to network and establish national and international collaborations;
- bring together leading experts from all relevant scientific domains to enhance the understanding of Artificial Intelligence;

Topics cover the following:

AI IN DOMAIN-SPECIFIC APPLICATIONS

- AI in Computational Biology, Medicine and Biomedical Applications
- AI in WWW, Communication, Social Networking, Recommender Systems, Games and E-Commerce
- AI in Finance and Risk Management

AI IN DATA ANALYTICS AND BIG DATA

- Visual Analytics for Big Data
- Computational Modeling for Big Data
- Large-scale Recommendation and Social Media Systems
- Cloud/Grid/Stream Data Mining for Big Velocity Data
- Semantic-based Big Data Mining

MACHINE LEARNING AND DATA MINING

- Pre-processing, Dimension Reduction and Feature Selection Computing, Bayesian and Neural Networks
- Learning Graphical Models and Complex Networks
- Active, Cost-Sensitive, Semi-Supervised, Multi-Instance, Multi-Label and Multi-Task Learning
- Transfer/Adaptive, Rational and Structured Learning

AAI2026 will host 16 keynote researchers. We have received more than 100 high-quality research papers. As a result of the strict review process and evaluation, the committee selected over 80 papers as extended abstracts.

After the review, full papers from the AAI2026 conference will be published by Springer Verlag in the series “**Applied Artificial Intelligence 5: Medicine, Biology, Chemistry, Financial, Games, Engineering**” and Special issue of IEEE OPEN JOURNAL OF ENGINEERING IN MEDICINE AND BIOLOGY with title: “**AI and computational modelling in cardiovascular disease**”. We must also admit that the conference certainly would not have been so successful without the efforts of many people who were actively engaged in organization of such a major academic event. We express gratitude to the members of the program and scientific review committee as well as to all the chairs, organizers and committee members for their dedication and support.

On behalf of the Organizing Committee, we wish you all a pleasant stay at Kragujevac and a productive conference.

Prof. Nenad Filipović, Conference Program Chair

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COMPARATIVE ANALYSIS OF LSTM AND BiLSTM MODELS FOR PATIENT BLOOD GLUCOSE PREDICTION

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Abstract:

Accurate prediction of blood glucose levels is critical for timely management of hyperglycemia and hypoglycemia in patients with Type 1 diabetes mellitus. Diabetes represents a growing global health challenge, with ineffective glycemic control leading to severe long-term complications including cardiovascular disease, neuropathy and kidney failure. Numerous studies have demonstrated the effectiveness of deep learning approaches for blood glucose prediction, as they can capture complex nonlinear dynamics and long-term temporal dependencies in physiological signals. In this study, we present a comparative analysis of Long Short-Term Memory (LSTM) and Bidirectional Long Short-Term Memory (BiLSTM) architectures for blood glucose prediction 30 minutes ahead, using a personalized modeling approach with one model trained per patient.

Both models were evaluated on the OhioT1DM dataset (2018 and 2020 releases), comprising continuous glucose monitoring (CGM) data from 12 patients with Type 1 diabetes, recorded at 5-minute intervals. The dataset includes physiological and behavioral signals such as CGM readings, insulin doses, meal information, and physical activity data. Both models take a 2-hour historical window (24 time steps, 7 features) as input. The LSTM uses two layers with 64 hidden units each, while the BiLSTM employs two bidirectional layers with an effective hidden size of 128 units per layer. Both models were trained for 50 epochs using the Adam optimizer ($\text{lr} = 0.001$), Mean Squared Error (MSE) loss, dropout (0.2), and gradient clipping. Model performance was assessed using RMSE (Root Mean Squared Error), Mean Absolute Error (MAE), Mean Absolute Relative Difference (MARD), and Time in Good Range (TG). The LSTM achieved a mean RMSE of 31.44 ± 24.16 mg/dL, MAE of 18.73 ± 9.23 mg/dL, MARD of $11.00 \pm 3.25\%$, and TG of $78.17 \pm 7.24\%$. The BiLSTM achieved a mean RMSE of 29.83 ± 17.42 mg/dL, MAE of 18.78 ± 7.44 mg/dL, MARD of $11.30 \pm 3.35\%$, and TG of $76.21 \pm 8.63\%$. Results indicate that neither architecture consistently outperforms the other across all patients, suggesting that individual glucose dynamics play a significant role in model performance. These findings highlight the potential of personalized deep learning approaches in clinical decision support systems for diabetes management.

Keywords: blood glucose prediction, LSTM, BiLSTM, deep learning, continuous glucose monitoring, Type 1 diabetes mellitus, OhioT1DM, hyperglycemia, hypoglycemia.

Acknowledgement: Authors acknowledge the funding by the Ministry of Science, Technological Development and Innovation of the Republic of Serbia, contract numbers [451-03-34/2026-03/200107 (Faculty of Engineering, University of Kragujevac)].