Preface

The main aim of the Sixteenth International Conference *Digital Presentation and Preservation of Cultural and Scientific Heritage (DiPP2026)* is to bring together as many interested institutions as possible working on digitising, recording, documenting, archiving, presenting, protecting and managing cultural and scientific heritage, so that they can share their advanced thoughts, know-how and experience. Public and specialised libraries, museums, galleries, archives, community centres, research institutions and universities are expected to share and acquire knowledge, skills, and expertise at the event.

C. Ioannidis, N. Moumoutzis and M. Christoulakis present eShadow LCE, an enhanced digital shadow theatre platform supporting real-time collaboration and AI-assisted puppet creation. The platform was evaluated during a teacher training event within the Stories4All Erasmus+ project, demonstrating strong usability and educational value for revitalising shadow theatre in inclusive classroom settings.

K. Stefanov proposes a taxonomy of AI-based educational systems and examines the pedagogical methods they support, based on a structured review of recent literature and policy documents. The paper analyses the transition from chatbots to specialised learning platforms, outlines national policy directions, and identifies near-term trends and risks for AI integration in education from primary school to PhD level.

B. Yavrukova, M. Goynov and D. Paneva-Marinova present a case study on the implementation of the CultIS platform at the Sofia University Library, examining the challenges, results, and perspectives of migrating 19 digital collections. The integration with the Bulgarian Portal for Open Science has transformed the library's strategic position, making it the largest metadata provider in the national portal.

D. A. Aranda examines the intersection of digital technologies with the preservation, accessibility, and economic valorisation of cultural heritage, drawing on case studies from major institutions. The paper analyses how digitalisation creates economic value across the complete tourist journey and proposes a framework of principles for responsible digital heritage development.

B. R. Neupane and D. Pradhananga argue that the transition from observation to openness in hydrological data governance has become a strategic necessity in a non-stationary world. The paper proposes a new governance paradigm anchored in FAIR principles, interoperability, and the doctrine of "as open as possible, as closed as necessary", with a layered policy agenda for Member States.

J. Both outlines how Vrije Universiteit Amsterdam developed integrated research data management services through researcher profiling, cultural-change strategies, and community building. The programme established a hub-and-spoke support model and a central RDM support desk, culminating in the university's Research and Software Management Policy.

G. Gurdal and G. K. Can investigate the impact of open access on scholarly visibility by analysing the GCRIS IZTECH platform. Quantitative data demonstrate that the platform's interoperable architecture is associated with increased global views, downloads, and citations, providing a concrete model for institutional digital transformation.

M. T. Artese, B. L. Cerchiai, E. Beligni, E. M. Alessi and M. Fortunati present MyStoriesBAG, a tool designed to facilitate and guide the creation of games or stories for users unfamiliar with technical implementation. The visual editor allows users to actively create content and then play with the stories created. The paper demonstrates how the tool, initially developed for cultural heritage, has been applied to physics and astronomy, giving rise to two games that have been successful with the public and students.

I. Kratchanov and D. Luchev explore the integration of three design frameworks – the Four-Dimensional Framework, Learning Mechanics–Game Mechanics, and Persuasive Systems Design – to create serious games for libraries. By aligning pedagogical goals with game mechanics and persuasive strategies, the authors propose a hybrid design approach that prioritises learner autonomy and emotional safety. The study emphasises that ethical, non-punitive design is essential for maintaining institutional trust and transforming intimidated visitors into confident library participants.

Z. L. Márkus, G. Szántó, T. Szkaliczki, M. Veres, Z. Weisz, S. Klein and J. J. Kiam present a gamified, guided thematic mobile walk to visit selected bridges of Munich and discover their cultural heritage values. The mobile application guides users along the Isar river, automatically activating location-relevant content, mini-games and AR exercises as participants approach each site. The walk introduces the Isar flood of 1899, the history of Munich's bridges, and the town's new riverscape following the flood.

M. Monova-Zheleva and Y. Zhelev propose a digital framework for documenting and communicating endangered craft practices through structured documentation, storytelling, and distribution. Based on a study conducted in Bulgaria, Italy, and Türkiye, the framework comprises three layers – documentation, narrative mediation, and user interaction – supporting accessibility, community engagement, and sustainable transmission of knowledge.

S. Bozov and E. Zaharieva-Stoyanova present a technique-aware digital embroidery simulator that represents the stitching process by following the needle movement path. The application features a dual-view interface showing both front and back sides of the embroidery and supports gaze- and voice-based interaction for hands-free control, enabling users with physical disabilities to use the software and facilitating the preservation of traditional embroidery knowledge.

R. Lazarova, V. Tabakova-Komsalova, E. Kanevska-Nikolova and S. Stoyanov present a prototype intelligent language modelling system implemented in Prolog for the preservation of Rhodope dialects. The system converts dialectal into standard Bulgarian lexical units and vice versa, generating the corresponding grammatical form, and includes a module for phonetic features, demonstrating the application of symbolic AI in digital cultural heritage.

M. Riparante, M. Goynov, D. Luchev, D. Paneva-Marinova and L. Pavlova present a hybrid data-model architecture developed for the Repertorium of South Slavonic Manuscripts and Copyists. The model functions simultaneously as a structured storage

schema, an ontological model, and a framework governing data representation and interface behaviour, reducing schema–interface divergence and improving data consistency.

A. I. Iliev, S. Mallick and G. Ganesh evaluate whether AI-assisted refactoring prioritization can reduce technical debt more effectively than traditional rule-based static analysis. Across a dataset of 120,000 code samples and six real Java source files, AI-assisted prioritization achieves 18%–89% greater cumulative complexity reduction compared to rule-based baselines. The study demonstrates how intelligent, structured analysis tools can preserve and improve access to complex technical information assets over time.

E. Georgieva, T. Georgiev and T. Stefanova investigate how artificial intelligence and collaboration platforms enhance scientific heritage access within academic ecosystems. The analysis examines advanced digitization methods, semantic networks, autonomous research agents, and mainstream database AI integrations. Findings indicate that while these technologies democratize knowledge, institutions must proactively address inherent ethical, legal, and cybersecurity vulnerabilities.

T. Ballı and E. F. Yetkin investigate EEG-based evaluation of immersive VR experiences using a publicly available dataset of 51 participants exposed to visual and audiovisual simulations of the Edzná Maya archaeological site. Frontal theta, occipital alpha, and engagement index are examined as cognitive engagement markers. The findings provide a neurophysiological baseline for future neuroadaptive AI-driven heritage VR systems.

M. Kraev examines the reliability and domain limitations of intelligent virtual assistants in digital heritage systems. The paper analyses the challenges of answer relevance, domain generalization, and computational constraints, and discusses approaches such as parameter-efficient fine-tuning and Retrieval-Augmented Generation to overcome them. The study argues that AI reliability in digital heritage should be perceived as a systemic design challenge requiring coordinated work on model design, evaluation methods, and infrastructure.

G. A. Gowda, S. Samal, A. Malik and A. I. Iliev present a multimodal approach to the digital presentation and preservation of cultural and scientific heritage, integrating indexing, automated metadata enrichment and semantic linking. The framework utilizes a shared semantic space to fuse text, visual, and audio modalities while employing a Semantic Anchor strategy to prevent the erasure of legacy metadata. Experimental findings demonstrate a Mean Precision @ 5 of 0.92 and a 100% Data Retention rate.

M. Mouaki Benani and I. Onescu explore architectural heritage representation in cinema and digital filmmaking through fictional, documentary, and hybrid modes. Using digital visualization and narrative analysis, the paper examines digital reconstruction, computer-generated imagery, accuracy, and audience understanding. Selected case studies show how cinematic heritage can attract audiences while requiring evidence to avoid historical and architectural distortion.

M. Mouaki Benani applies a quantitative visual analysis method to reveal spatial distortion in the arena scene of the film Pompeii (2014). Through projected-area analysis, the study demonstrates that the human figure occupies only 0.41% of the visible architectural surface on average, with architecture dominating by a factor of ≈244×.

The findings illustrate how cinematic exaggeration can create "mind ruins" that prioritise engagement over authenticity.

O. Kevseroglu and R. Kurban introduce the Kayseri Digital Atlas project, a mobile application built with Flutter and supported by a web interface, created to document both the tangible and intangible cultural heritage of Kayseri's Cumhuriyet Neighbourhood. Through a custom data-entry system, the project has systematically collected more than 2,000 archival and oral history records, establishing a well-structured platform that can serve as a foundation for future efforts such as AI-driven classification and digital reconstruction.

D. Sarca, A. H. Pescaru and I.-G. Zsak examine digital methods employed in urban heritage analysis through a systematic review of 69 studies indexed in the Web of Science Core Collection (2010–2026) following the PRISMA 2020 reporting framework. The review identifies the main methodological families – including GIS-based spatial modelling, multi-criteria evaluation, and configurational approaches – and the dominant types of spatial data and analytical outputs. The study highlights the need for more transparent, integrative, and interdisciplinary methodological frameworks in urban heritage research.

C. A. Drăghici and I. Onescu integrate Life-Cycle Assessment into the heritage conservation framework for Lugoj's historical center, comparing minimal repairs to retrofits for masonry structures. The results favour low-impact interventions that extend service life, demonstrating that moderate retrofit interventions can reduce life-cycle emissions by approximately 5–15% when maintenance and operational energy costs are considered together. The study shows that LCA can serve as both a diagnostic and strategic tool for heritage preservation.

D. Tatić, M. Goynov and R. Stanković present a development in constructing an Avatar system based on AI technology to answer textual questions in museum exhibitions, using the Ollama tool and implementing a Retrieval-Augmented Generation architecture. Four systematic experiments with varying chunking parameters, retrieval methods, and system configurations were conducted using an exhibition catalogue dedicated to Serbian mathematician Mihailo Petrović Alas as the knowledge source. The best configuration achieved 94% correct answers, establishing a foundation for developing reliable AI text-answering systems that can enhance visitor engagement.

C. A. Drăghici proposes a Core Spatial Design Framework for reviving the blue-green corridor along the Timiș River in Lugoj to enhance resilience and accessibility. The framework combines river restoration, nature-based infrastructure, stakeholder collaboration, and community activation through a multi-layered approach integrating connectivity, strategic design instruments, nature-based solutions, and community engagement. Reactivating the corridor through this framework can improve flood resilience, biodiversity, and public accessibility while preserving cultural heritage.

B. C. Gomboș, R.-A. Stoleru, I. Kisilewicz and I. Ostrovsca develop a methodological framework for translating Brebu's rural cultural landscape into an interactive digital route. Through narrative mapping, digital storytelling, heritage records, and layered documentation, the study structures tangible and intangible values into an interpretive platform. The results show that digital mediation can strengthen documentation, accessibility, public engagement, and long-term heritage transmission for future generations.

E. Nikolova presents an integrated conceptual framework for digital immersive experiences in cultural tourism, consisting of technological, cultural, behavioral, and management-ethical layers. The framework systematically connects these layers through dynamic feedback loops, focusing on cultural authenticity, institutional accountability, and measurable social, educational, and tourism impacts. The study addresses the lack of comprehensive models for digital presentation of cultural heritage in a tourism context.

O. Iliev proposes a heritage-aware decision model for selecting communication architectures for transactional kiosk systems under infrastructure constraints in cultural heritage environments. Using an AHP–TOPSIS framework and empirical evaluation, the study compares protocols across LAN and hybrid KNX–IP environments, showing that hybrid solutions can ensure reliability with acceptable latency. The main contribution is a multi-criteria model that integrates infrastructure constraints directly into the decision-making process.

M. Petrova and O. Vointseva examine how Georgia uses the "Cradle of Wine" narrative in country marketing and in the digital presentation of cultural heritage. Through qualitative content analysis of official tourism communication, wine-promotion materials, and selected mediated texts, the study shows that heritage works differently across audiences: familiar publics respond to recognition cues, whereas unfamiliar markets require clearer explanation and stronger quality proof. The paper proposes recognition-first, proof-first, and hybrid communication strategies, arguing that digital and media-based visibility can support the broader safeguarding environment of living heritage.

H. M. K. Murthy and A. I. Iliev present a Trustworthy Retrieval-Augmented Generation framework designed for the digital preservation and transparent presentation of biomedical knowledge, integrating ontology-aware retrieval, hybrid BM25 + dense search, sentence-level attribution, and a novel composite Biomedical Trust Index. On the MedQuAD corpus, the framework achieves 89.1% top-5 recall, 85.6% attribution accuracy, and a BTI of 0.84 on clean data. The study demonstrates that trustworthiness in biomedical RAG is a multidimensional, structurally designable concept rather than an emergent attribute of model scale.

B. C. Gomboș, I. M. Kisilewicz and A.-A. Fratiman examine how digital approaches can be used in the rehabilitation of residential built heritage for creating immersive spatial visualizations. Using a case study of a studio apartment in a heritage building in Oradea, Romania, the study integrates Historic Building Information Modeling and Extended Reality tools to facilitate interdisciplinary collaboration and more effective intervention strategies. The digital workflow supports comparison and scenario testing, reducing the degree of uncertainty and enabling informed decision-making based on a clear assessment of risks.

R. R. Yoshinov, B. R. Yoshinov and I. B. Koleva present the development of an electronic archive "Rehabilitation after Soft-Tissue Lesions of the Knee Complex" for post-graduate medical and health professions education. The archive preserves the scientific heritage of the Bulgarian Ortho-rehabilitation School and integrates traditional scientific resources, contemporary clinical guidelines, and educational materials. Evaluation of 102 participants shows significant improvement in professional competencies across

five key domains, confirming the effectiveness of digital repositories in post-graduate medical education.

M. Ivanova examines cultural heritage as an object of legal protection in the context of digitalisation, analysing international, European and national legal frameworks. The study identifies key challenges related to copyright, digital reproduction, and the management of digital cultural resources, and proposes directions for legal framework adaptation. The paper argues that the digital form of cultural value should be established as an independent object of legal protection requiring the development and harmonization of legal norms at international and national levels.

Y. Chantova puts forward a conceptual model for transforming the Bulgarian State Archives from digitization to digitalization practices. Using conceptual analysis and archival standards, the study identifies systemic, metadata, and AI integration layers, arguing that sustainable digital archives demand an infrastructure based on interoperability, long-term preservation, and advanced access to archival knowledge. The proposed three-level model – technical, systemic, and intelligent – provides a framework for transitioning from isolated digitization efforts to a fully integrated socio-technical archival infrastructure.

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