Editorial
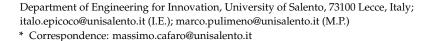
State-of-the-Art Future Internet Technology in Italy 2022–2023

Massimo Cafaro *[ID], **Italo Epicoco** [ID] and **Marco Pulimeno** [ID]

Department of Engineering for Innovation, University of Salento, 73100 Lecce, Italy;
italo.epicoco@unisalento.it (I.E.); marco.pulimeno@unisalento.it (M.P.)
*   Correspondence: massimo.cafaro@unisalento.it

This Special Issue aims to provide a comprehensive overview of the current state of the art in Future Internet Technology in Italy. We invited research articles related to current trends and key technologies to consolidate our understanding in this area.

In [1], the authors address anonymous service delivery. For decades, anonymous service delivery has attracted the interest of both the academic and business communities. For solutions to be effective, it is necessary to ensure anonymity even when dealing with the service provider. However, the implementation of complete user anonymity would preclude the provision of any accountability mechanism. This presents a significant concern, particularly in situations where an anonymous user may engage in illicit activities while utilising the service. In this manuscript, the authors propose a blockchain-based solution in order to balance accountability and anonymity. The proposed solution specifically depends on the cooperation of three autonomous entities, including the service provider. Only through the combined efforts of all three actors is it possible to reveal the user's true identity. Otherwise, complete anonymity is ensured. To demonstrate the proposal's viability, a prototype has been built, featuring intuitive interfaces that reduce the number of client-side operations.

The authors of [2] discuss the use of virtual environments in the context of furnishings sales in a traditional retail store. Typically, furniture selection in a retail establishment is determined by a product catalogue and basic product renderings showcasing various configurations. A Multi-Sensory In-Store Virtual Reality Customer Journey (MSISVRCJ) is evaluated in this preliminary field study via a virtual catalogue and a product configurator in order to facilitate the sale of furnishings. The system enables patrons to remain fully engaged in the virtual environment (VE) while the sales representative manipulates the furniture's hues, textures, and finishes, while also investigating various VEs. Furthermore, consumers have the opportunity to engage in authentic tactile feedback by examining furniture samples in store. For a furniture manufacturer, the system is executed and evaluated in a flagship location. Fifty authentic consumers provided favourable evaluations with regard to the overall contentment, perceived authenticity, and reception. This approach has the potential to enhance consumer confidence in purchases, decrease startup expenses, and capitalise on the advantages of in-store purchasing over online shopping.

The implementation of attention-based architectures has substantially enhanced the efficacy of neural sequence-to-sequence models utilised in the context of text summarization. While these models have demonstrated efficacy in summarising documents written in English, their applicability to other languages is restricted, thus providing ample opportunity for enhancement. To overcome this difficulty, the authors of [3] introduce BART-IT, an Italian-language sequence-to-sequence model built upon the BART architecture. After acquiring language-specific features through pre-training on a large corpus of Italian-written texts, the model undergoes fine-tuning on a number of benchmark datasets designed for abstractive summarization. Based on the experimental findings, BART-IT demonstrates superior performance in terms of ROUGE scores when compared to other contemporary models, despite having a considerably reduced parameter count. BART-IT can facilitate

the creation of engaging natural language processing (NLP) applications tailored to the Italian language.

In [4], the authors propose a simple model of knowledge scaffolding, with an application in roughly approximating the asymptotic growth of Wikipedia. Taking into account a corpus of knowledge consisting of items linked in an acyclic fashion, essentially a tree in which the items at higher levels are built and derived from those at the lower levels, the authors build the model and use it to assess the time growth of the corpus (with regard to the number of items) and the maximum knowledge, both showing a power law. Another result shown is related to the number of "holes" in the knowledge corpus, which always remains limited.

Industry 4.0 is the subject of [5]. The authors thoroughly analyse and discuss one of the key challenges that hinders the full adoption of Industry 4.0, i.e., the integration of Operation Technology networking and Information Technology networking. In particular, they deal with the technical challenges and discuss potential tools, also providing a state-of-the-art use case scenario. A possible solution, based on the Asset Administration Shell approach, is showcased.

To support healthcare operators, in [6], the authors propose Heart DT, a novel digital platform based on the combination of a digital twin, artificial intelligence, and IoT sensors. Indeed, current healthcare facilities are in need of innovative digital tools to meet the increasing demand for technology that assists healthcare operators. The ubiquitous adoption of Internet of Things (IoT) devices in everyday life, which are capable of gathering biomedical and biometric data and present the medical community with a chance to implement novel instruments, along with digital twins (DTs) and artificial intelligence provides the foundations on which Heart DT is built. The platform allows for the acquisition and evaluation of electrocardiogram (ECG) signals; moreover, this platform, which is based on microservices, is part of a higher-level platform for the complete management and monitoring of cardiac pathologies.

In [7], the authors deal with technical debt, which pertains to choices made throughout the software development process that delay the resolution of technical issues or the addition of new features until a subsequent time. Self-admitted technical debt is defined as the act of intentionally and consciously adding specific annotations to source code in order to accumulate technical debt. Self-admitted technical debt in open-source blockchain initiatives, which are distinguished by the implementation of an emerging technology and the imperative to establish confidence, are examined in this manuscript. Through using NLP techniques for the classification of remarks extracted from the source code of ten projects selected on the basis of capitalization and popularity, the self-admitted technical debt has been analysed. Previous analyses of open-source projects that did not involve blockchain technology were contrasted with the findings of self-admitted technical debt in the blockchain initiatives. The self-admitted technical debt design in blockchain initiatives surpasses the technical debt requirement, according to the findings. Certain initiatives had a low proportion of self-admitted technical debt in the comments but a high proportion of source code files with debt, according to the analysis. Furthermore, it has been observed that self-admitted technical debt is more widespread and more evenly distributed in blockchain projects compared to reference Java projects, on average.

A multitude of practical smart city application scenarios necessitate the integration of joint analytics on unified perspectives of geo-referenced mobility data and contextual environmental data, such as meteorological and pollution data. In [8], the authors present the design and prototyping of an innovative system, denoted as EMDI. This system enables a unified view of integrated analytics by augmenting human and vehicle mobility data with pollution information. Single geo-statistics, such as 'mean', and Top-N queries are among the many that the system is capable of processing. Furthermore, it provides geo-visualization capabilities on the combined view. The system has been rigorously evaluated using substantial geo-referenced mobility and environmental data originating from the

Italian city of Bologna. The outcomes indicate that the system can be utilised effectively for large-scale, advanced combined pollution-mobility analytics with QoS guarantees.

The e-learning industry may be profoundly influenced by the implementation of natural language processing and artificial intelligence methods, such as chatbots, automated correctors, and scoring systems. In [9], the authors discuss how to effectively integrate such technologies into the business environment; this requires not only the development of a predictive model with high performance, but also the following: (i) an exhaustive examination of the task at hand, (ii) a systematic approach to gathering data, and (iii) an empirical assessment of its practical applicability. Furthermore, it is critical to construct a comprehensive IT infrastructure that establishes connections between the AI system, the organization's database, human employees, users, and more. Based on the cutting-edge BERT model, the authors present a practical system in this manuscript that incorporates an automatic scoring mechanism for Italian-language open-ended questions. More precisely, these inquiries concern the mandatory workplace safety courses that are typically delivered through e-learning platforms, including the one provided by Mega Italia Media. A comprehensive account of the design, evaluation, and deployment of the system for commercial purposes, detailing its seamless integration with the company's other services, is given.

Ensuring the accurate and efficient assessment of security attributes is critical for the implementation of robust cyberspace defence strategies. In [10], the authors introduce GRAPH4, a system that integrates various security metrics to devise an attack detection methodology that takes advantage of the strengths inherent in contemporary network architectures. GRAPH4 extracts a view of the network components that necessitate monitoring by utilising attack graphs generated by the control plane. This view is determined by the precise nature of the attack that needs to be identified and the comprehensive knowledge of the network architecture. It facilitates the distribution of security metrics duties between the data plane and the control plane in an efficient manner. By converting the attack graph into network rules, which are then implemented in programmable nodes, line-rate alerting and the detection of network anomalies is made possible. By utilising security metric scores and data plane programmability, GRAPH4 optimises proactive defence, enables timely responses to unforeseen conditions, and optimises resource allocation.

References

1. Buccafurri, F.; De Angelis, V.; Lazzaro , S. A Blockchain-Based Framework to Enhance Anonymous Services with Accountability Guarantees. *Future Internet* **2022**, *14*, 243. [CrossRef]
2. Fiorentino, M.; Ricci, M.; Evangelista, A.; Manghisi, V.M.; Uva, A.E. A Multi-Sensory In-Store Virtual Reality Customer Journey for Retailing: A Field Study in a Furniture Flagship Store. *Future Internet* **2022**, *14*, 381. [CrossRef]
3. La Quatra, M.; Cagliero, L. BART-IT: An Efficient Sequence-to-Sequence Model for Italian Text Summarization. *Future Internet* **2023**, *15*, 15. [CrossRef]
4. Bagnoli, F.; de Bonfioli Cavalcabo', G. A Simple Model of Knowledge Scaffolding Applied to Wikipedia Growth. *Future Internet* **2023**, *15*, 67. [CrossRef]
5. Berardi, D.; Callegati, F.; Giovine, A.; Melis, A.; Prandini, M.; Rinieri, L. When Operation Technology Meets Information Technology: Challenges and Opportunities. *Future Internet* **2023**, *15*, 95. [CrossRef]
6. Avanzato, R.; Beritelli, F.; Lombardo, A.; Ricci, C. Heart DT: Monitoring and Preventing Cardiac Pathologies Using AI and IoT Sensors. *Future Internet* **2023**, *15*, 223. [CrossRef]
7. Pinna, A.; Lunesu, M.I.; Orrù, S.; Tonelli, R. Investigation on Self-Admitted Technical Debt in Open-Source Blockchain Projects. *Future Internet* **2023**, *15*, 232. [CrossRef]

8.   Al Jawarneh, I.M.; Foschini, L.; Bellavista, P. Efficient Integration of Heterogeneous Mobility-Pollution Big Data for Joint Analytics at Scale with QoS Guarantees. *Future Internet* **2023**, *15*, 263. [CrossRef]

9.   Arici, N.; Gerevini, A.E.; Olivato, M.; Putelli, L.; Sigalini, L.; Serina, I. Real-World Implementation and Integration of an Automatic Scoring System for Workplace Safety Courses in Italian. *Future Internet* **2023**, *15*, 268. [CrossRef]

10.   Gori, G.; Rinieri, L.; Al Sadi, A.; Melis, A.; Callegati, F.; Prandini, M. GRAPH4: A Security Monitoring Architecture Based on Data Plane Anomaly Detection Metrics Calculated over Attack Graphs. *Future Internet* **2023**, *15*, 368. [CrossRef]