Curriculum Vitae et Studiorum

di Enrico Corradini

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Questo curriculum è strutturato come di seguito specificato: la Sezione 1 illustra le attività di istruzione e formazione di Enrico Corradini. La Sezione 2 riporta le attività didattiche svolte da Enrico Corradini. La Sezione 3 descrive le pubblicazioni scientifiche di Enrico Corradini. Nella Sezione 4 vengono riportati i progetti di ricerca a cui Enrico Corradini ha preso parte. La Sezione 5 descrive i premi e i riconoscimenti che egli ha conseguito durante le sue attività di istruzione e formazione. La Sezione 6 presenta le sue competenze tecniche, linguistiche e comunicative. La Sezione 7 descrive i software e le applicazioni sviluppate e distribuite autonomamente. Infine, la Sezione 8 fornisce una descrizione molto breve dei suoi interessi di ricerca.

1 Attività di istruzione e formazione

1.1 Attività di istruzione

Nel Settembre 2008, Enrico Corradini si è iscritto presso il Liceo Scientifico "L.Cambi" a Falconara M.ma (AN) dove ha conseguito il Diploma di Maturità Scientifica con votazione di 100/100 nel Luglio 2013.

Nell'Ottobre 2013 si è iscritto al Corso di Laurea in *Ingegneria Informatica e dell'Automazione* presso la Facoltà di Ingegneria dell'Università Politecnica delle Marche dove ha conseguito, il 10 Febbraio 2017, la Laurea Triennale con votazione di 102/110, discutendo una tesi dal titolo "Valutazione della frequenza cardiaca tramite Smartwatch Android".

Nell'Ottobre 2017 si è iscritto al Corso di Laurea Magistrale in *Ingegneria Informatica e dell'Automazione* presso la Facoltà di Ingegneria dell'Università Politecnica delle Marche. Si è laureato il 28 Ottobre 2019 con votazione 110 e lode e tesi dal titolo "Un nuovo framework per l'analisi di utenti "bridge" in Yelp".

Dal 2019 al 2022 Enrico Corradini ha svolto il Dottorando di Ricerca in Ingegneria dell'Informazione presso il Dipartimento di Ingegneria dell'Informazione (DII) dell'Università Politecnica delle Marche. Ha conseguito il titolo di Dottore di Ricerca il 16 Marzo 2023, discutendo una tesi dal titolo "Networking people and things: scenarios, models, and approaches".

Dal 1 Novembre 2019 è Assegnista di Ricerca presso il Dipartimento di Ingegneria dell'Informazione (DII) dell'Università Politecnica delle Marche.

1.2 Attività di formazione

Da Marzo 2017 a Settembre 2017, Enrico Corradini ha svolto un tirocinio post-laurea come *Analista Programmatore*, finalizzato all'assunzione, presso "Engineering Ingegneria Informatica SpA" sede di Osimo (AN). In questo periodo, ha partecipato allo sviluppo del software gestionale dell'azienda acquisendo conoscenze e competenze sulla gestione del DBMS Oracle e sulle tecniche di sviluppo nel linguaggio PL/SQL.

Nel Dicembre 2016, ha conseguito un certificato di "Formazione Generale alla Salute e sicurezza sul lavoro" presso l'*Università Politecnica della Marche*, come riportato in allegato.

Nei mesi di Febbraio-Maggio 2019, ha svolto un corso di 12 settimane dal titolo "Cloud Computing Learning Path" co-organizzato dall'Università Politecnica delle Marche e da Microsoft. Al termine, il 31 Maggio 2019, ha ottenuto un certificato che attesta le conoscenze e competenze acquisite nei seguenti campi:

- Azure fundamentals;
- Administer Containers in Azure;
- Administer infrastructures resources in Azure;
- Store data in Azure.

Dal 28 Gennaio 2020 al 19 Febbraio 2020 ha seguito il corso "Project Management Techniques" della Scuola di Dottorato dell'Università Politecnica delle Marche.

Dal 2 Aprile 2020 al 29 Maggio 2020 ha seguito il corso "Mathematical programming and graph theory" della Scuola di Dottorato dell'Università Politecnica delle Marche.

Dal 12 Gennaio al 23 Febbraio 2021 ha seguito un ciclo di seminari su Probabilità e Statistica presso l'Università Politecnica delle Marche, per un totale di 8 ore.

Dal 19 Febbraio al 22 Marzo 2021, Enrico Corradini ha seguito un corso dal titolo "Blockchain Basics" sulla piattaforma Coursera, per un totale di 19 ore.

Dal 7 Aprile al 16 Aprile 2021 ha seguito un ciclo di seminari dal titolo "Sicurezza, Privacy e Trust nell'IoT" presso l'Università Politecnica delle Marche, per un totale di 8 ore.

Dal 31 Marzo 2021, Enrico Corradini partecipa attivamente ad un reading group settimanale con dottorandi dell'Università di Pavia.

Dal 4 Ottobre al 30 Novembre 2021, Enrico Corradini ha svolto un periodo di ricerca presso il dipartimento DEMACS dell'Università della Calabria, sotto la supervisione del Prof. Giorgio Terracina.

Il 24 Novembre 2021, Enrico Corradini ha seguito un seminario intitolato "Cryptocurrency market manipulations" organizzato dal DEMACS (UniCal).

Dall'11 Gennaio 2022 al 15 Febbraio 2022, Enrico Corradini ha seguito il corso "Machine Learning e Data Science", presso l'Università Politecnica delle Marche.

Dal 1 Ottobre al 15 Ottobre 2022, Enrico Corradini ha svolto un periodo di ricerca presso il Dipartimento di Ingegneria Industriale e Dell'informazione, sotto la supervisione del Prof. Antonino Nocera.

2 Attività didattiche

Nel mese di Dicembre 2019 ha tenuto un corso di formazione di 12 ore presso l'azienda *Selda Informatica* di Ascoli Piceno. Il tema del corso era "Introduzione al Machine Learning in Python".

Dal mese di Marzo 2020 al mese di Giugno 2020, Enrico Corradini ha tenuto le esercitazioni del corso "Programmazione Mobile" presso il corso di laurea triennale in "Ingegneria Informatica e dell'Automazione" dell'Università Politecnica delle Marche.

Nei mesi di Maggio e Giugno 2020, Enrico Corradini ha tenuto un corso di formazione di 10 ore presso l'azienda *FairConnect* di Teramo. Il tema era "Software e gestione di Big Data".

Nei mesi di Luglio e Settembre 2020, Enrico Corradini ha tenuto un corso di specializzazione in "Data Science" presso l'istituto ISTAO di Ancona. Il corso ha avuto una durata di 26 ore.

Dal 15 Ottobre 2020 al 22 Ottobre 2020, ha tenuto un corso dal titolo "Python Avanzato" presso l'azienda *Selda Informatica* di Ascoli Piceno. Il corso ha avuto una durata di 12 ore.

Dal 2 Marzo 2021 al 6 Giugno 2021, Enrico Corradini ha tenuto le esercitazioni del corso "Ingegneria del Software" presso il corso di laurea triennale in "Ingegneria Informatica e dell'Automazione" dell'Università Politecnica delle Marche, per un totale di 24 ore.

Il giorno 15 Aprile 2021, Enrico Corradini ha tenuto un seminario di due ore dal titolo "Come sviluppare un'app per il grande pubblico" durante il corso "Programmazione Mobile" presso il corso di laurea triennale in "Ingegneria Informatica e dell'Automazione" dell'Università Politecnica delle Marche.

Dal 22 Aprile 2021 al 6 Maggio 2021, ha tenuto un corso su "Social Network Analysis" di 15 ore presso *FairConnect* di Teramo.

Il 29 Giugno 2021, Enrico Corradini ha tenuto un corso di "Social Network Analysis" di 5 ore presso l'azienda *Xplace* di Osimo.

Dal 5 Luglio 2021 al 21 Luglio 2021 ha tenuto 22 ore di lezione al corso di specializzazione "Data Science per l'impresa - 3a edizione", presso ISTAO, Ancona.

Dal 22 Marzo 2022 al 27 Luglio 2022 ha tenuto un corso di 10 ore presso l'azienda DBFix, su Business Intelligence e Data Science in Python.

Da fine Marzo 2022 a fine Maggio 2022 ha tenuto due corsi di 3 ore ciascuno per PerFormativa Academy, piattaforma didattica online. I corsi riguardavano Business Intelligence.

Dal 2 Marzo 2022 al 4 Giugno 2022, Enrico Corradini ha tenuto le esercitazioni del corso "Ingegneria del Software" presso il corso di laurea triennale in "Ingegneria Informatica e dell'Automazione" dell'Università Politecnica delle Marche, per un totale di 24 ore.

Il giorno 12 Maggio 2022, Enrico Corradini ha tenuto un seminario di due ore dal titolo "Come pubblicare un'app" durante il corso "Programmazione Mobile" presso il corso di laurea triennale in "Ingegneria Informatica e dell'Automazione" dell'Università Politecnica delle Marche.

Durante il suo periodo presso l'Università Politecnica delle Marche è stato correlatore di diverse tesi triennali nell'ambito della programmazione mobile e dell'ingegneria del software.

Dal 3 Marzo 2023 al 9 Giugno 2023, Enrico Corradini ha tenuto le esercitazioni del corso "Ingegneria del Software" presso il corso di laurea triennale in "Ingegneria Informatica e dell'Automazione" dell'Università Politecnica delle Marche, per un totale di 24 ore.

3 Pubblicazioni

Di seguito sono riportate le pubblicazioni scientifiche di cui Enrico Corradini è autore o co-autore.

1. E. Corradini, A. Nocera, D. Ursino, L. Virgili, "Defining and detecting k-bridges in a social network: the Yelp case, and more", Knowledge-Based Systems, 2020.
   In this paper, we introduce the concept of k-bridge (i.e., a user who connects sub-networks of the

same network or networks of a multi-network scenario) and propose an algorithm for extracting k-bridges from a social network. Then, we analyze the specialization of this concept and algorithm in Yelp and we extract several knowledge patterns about Yelp k-bridges. In particular, we investigate how some basic characteristics of Yelp k-bridges vary against (i.e., against the number of macro-categories which the businesses reviewed by them belong to). Then, we verify if there exists an influence exerted by k-bridges on their friends and/or on their co-reviewers. We also analyze the relationship between k-bridges and power users. In addition, we investigate the relationship between k-bridges and the main centrality measures in the macro-categories of Yelp. We also propose two further specializations of k-bridges, regarding Reddit and the network of patent inventors, to prove that the knowledge on k-bridges we initially found in Yelp is not limited to this social network. Finally, we present two use cases that can highly benefit from the knowledge on k-bridges detected through our approach.

2. F. Cauteruccio, E. Corradini, G. Terracina, D. Ursino, L. Virgili, "Co-posting Author Assortativity in Reddit", SEBD2020, 2020.
   In the context of social networks, a renowned paper of New- man introduced the notion of "assortativity", also known as "assortative mixing". Strictly akin to the concept of homophily, it shows how much a node tends to associate with other nodes somewhat similar to it. Degree centrality is the most used similarity metrics for evaluating assortativ- ity between nodes, but several more could be dealt with. Assortativity was deeply investigated in many past researches, given different social platforms. However, Reddit was not one of the social networks taken into account, even if it is a really popular social medium. In this paper, we want to find out the possible presence of a form of assortativity in Reddit; in particular, we focus our analysis on co-posters, i.e. authors posting contents on the same subreddit.
3. F. Cauteruccio, L. Cinelli, E. Corradini, G. Terracina, D. Ursino, L. Virgili, C. Savaglio, A. Liotta, G. Fortino, "A framework for anomaly detection and classification in Multiple IoT scenarios", Future Generation Computer Systems, 2021.
   The investigation of anomalies is an important element in many scientific research fields. In recent years, this activity has been also extended to social networking and social internetworking, where different networks interact with each other. In these research fields, we have recently witnessed an important evolution because, beside networks of people, networks of things are becoming increasingly common. IoT and Multiple IoT scenarios are thus more and more studied. This paper represents a first attempt to investigate anomalies in a Multiple IoT scenario (MIoT). First, we propose a new methodological framework that can make future investigations in this research field easier, coherent, and uniform. Then, in the context of anomaly detection in an MIoT, we define the so-called "forward problem" and "inverse problem". The definition of these problems allows the investigation of how anomalies depend on inter-node distances, the size of IoT networks, and the degree centrality and closeness centrality of anomalous nodes. The approach proposed herein is applied to a smart city scenario, which is a typical MIoT. Here, data coming from sensors and social networks can boost smart lighting in order to provide citizens with a smart and safe environment.
4. E. Anceschi, G. Bonifazi, M. C. de Donato, E. Corradini, D. Ursino, L. Virgili, "Savemenow.ai: A machine learning based wearable device for fall detection in a workplace", Studies in Computational Intelligence, 2021.
   Slips, trips and falls are among the main causes of accidents in a workplace. For this reason, many fall detection approaches have been proposed in the literature. One of the most important categories of approaches is based on the usage of wearable devices. These devices have many advantages, but they also pose some challenging open issues. In particular, they must not be bulky, must have low power consumption and must be able to optimize the low computational power available. In this paper, we aim at facing these challenges by proposing SaveMeNow.AI, a new wearable device for fall detection. SaveMeNow.AI is based on the deployment of a Machine Learning approach for fall detection embedded in it. This approach exploits data continuously measured by a six-axis IMU present inside the device.
5. E. Corradini, S. Nicolazzo, A. Nocera, D. Ursino, L. Virgili, "Increasing protection and autonomy in the IoT through a two-tier blockchain framework (Discussion paper), SEBD2021."
   In this paper, we propose an approach that uses a two-tier blockchain framework and a trust-based protection mechanism to increase the security and autonomy of smart objects in the IoT. The proposed approach groups the involved smart objects into suitable communities. The two

blockchains perform different, but complementary, tasks. Indeed, the first-tier blockchain is local and records probing transactions performed to evaluate the trust of one smart object in another. Periodically, after a time window, the probing transactions are aggregated to determine the reputation of each smart object within its community and the trust of one community in each of the others. These values are stored in the second-tier blockchain. This paper describes the proposed approach, the underlying framework, the behavior, the security model and a test carried out to evaluate its performance.

6. G. Bonifazi, E. Corradini, G. Porcino, A. Scopelliti, D. Ursino, L. Virgili, "Applying generative adversarial networks to perform gaze path prediction in web", SEBD2021.
   In recent years, gaze path prediction has become a topic widely studied by computer scientists, who have proposed a variety of approaches to address this issue in the context of natural images. Among these approaches, the ones based on deep learning and, in particular, on Generative Adversarial Networks (GANs) have proven to be extremely accurate. When moving from natural images to websites, gaze path prediction becomes much more complex. As an evidence of this fact, no GAN-based approaches have yet been presented to solve this problem. In this paper, we aim at filling this gap by proposing two GAN-based approaches capable of predicting the gaze path of a user when looking at a website.
7. F. Cauteruccio, C. Enrico, G. Terracina, D. Ursino, L. Virgili, "An investigation on not safe for work adult content in Reddit", SEBD2021.
   Reddit is one of the few social platforms that handles NSFW (Not Safe For Work) content in an explicit and well-structured way. Despite this fact, such an issue has been very neglected in the past by researchers who have studied this social network. In this paper, we aim at providing a contribution in this setting by proposing an approach to extract and analyze text patterns from NSFW content in Reddit. An important peculiarity of our approach is that patterns are extracted not only based on their frequency (as it generally happens in the past literature), but also, and especially, on one or more utility measures.
8. E. Corradini, A. Nocera, D. Ursino, L. Virgili, "Investigating the phenomenon of NSFW posts in Reddit", Information Sciences, 2021.
   In this paper, we study the characteristics of NSFW (Not Safe For Work) posts in Reddit, highlighting their differences from SFW (Safe For Work) posts, which have been much more studied in the past literature. In our investigation, we studied all Reddit posts from 2019. Through both descriptive analytics techniques and social network analysis techniques, we extract three findings on the main differences between NSFW and SFW posts in Reddit. Thanks to these findings, we are able to better understand the dynamics (authors, subreddits, readers) behind NSFW posts. In particular, it becomes clear that this is a niche world where authors are strongly cohesive. However, at the same time, the most popular ones show a clear opening to new authors, whom they are willing to collaborate with, from the beginning.
9. E. Corradini, A. Nocera, D. Ursino, L. Virgili, "Investigating negative reviews and detecting negative influencers in Yelp through a multi-dimensional social network based model", International Journal of Information Management, 2021.
   In this paper, we propose an investigation of negative reviews and define the profile of negative influencers in Yelp. The methodology adopted to achieve this goal consists of two phases. The first one is theoretical and aims at defining a multi-dimensional social network based model of Yelp, three stereotypes of Yelp users, and a network based model to represent negative reviewers and their relationships. The second phase is experimental and consists in the definition of five hypotheses on negative reviews and reviewers in Yelp and their verification through an extensive data analysis campaign. This was performed on Yelp data represented by means of the models introduced during the first phase. Its most important result is the construction of the profile of negative influencers in Yelp. The main novelties of this paper are: (i) the definition of the two social network based models of Yelp and its users; (ii) the definition of three stereotypes of Yelp users and their characteristics; (iii) the construction of the profile of negative influencers in Yelp.
10. G. Bonifazi, E. Corradini, D. Ursino, L. Virgili, "A Social Network Analysis–based approach to investigate user behaviour during a cryptocurrency speculative bubble", Journal of Information Science, 2021.
    In this article, we present a Social Network Analysis–based approach to investigate user behaviour during a cryptocurrency speculative bubble in order to extract knowledge patterns about it. Our approach is general and can be applied to any past, present and future cryptocurrency speculative

bubble. To verify its potential, we apply it to investigate the Ethereum speculative bubble happened in the years 2017 and 2018. We also describe several interesting knowledge patterns about the behaviour of specific categories of users that we obtained from this investigation. Furthermore, we describe how our approach can support the construction of an identikit of the speculators who maneuvered behind the Ethereum bubble analysed. Finally, we show that this capability of supporting the hunting for speculators is intrinsic of our approach and can cover past, present and future bubbles.

11. G. Bonifazi, E. Corradini, D. Ursino, L. Virgili, E. Anceschi, M. C. De Donato, "A machine learning based sentient multimedia framework to increase safety at work", Multimedia Tools and Applications, 2022.
In the last few decades, we have witnessed an increasing focus on safety in the workplace. ICT has always played a leading role in this context. One ICT sector that is increasingly important in ensuring safety at work is the Internet of Things and, in particular, the new architectures referring to it, such as SIoT, MIoT and Sentient Multimedia Systems. All these architectures handle huge amounts of data to extract predictive and prescriptive information. For this purpose, they often make use of Machine Learning. In this paper, we propose a framework that uses both Sentient Multimedia Systems and Machine Learning to support safety in the workplace. After the general presentation of the framework, we describe its specialization to a particular case, i.e., fall detection. As for this application scenario, we describe a Machine Learning based wearable device for fall detection that we designed, built and tested. Moreover, we illustrate a safety coordination platform for monitoring the work environment, activating alarms in case of falls, and sending appropriate advices to help workers involved in falls.
12. E. Corradini, S. Nicolazzo, A. Nocera, D. Ursino, L. Virgili, "A two-tier Blockchain framework to increase protection and autonomy of smart objects in the IoT", Computer Communications, 2022.
In recent years, the Internet of Things paradigm has become pervasive in everyday life attracting the interest of the research community. Two of the most important challenges to be addressed concern the protection of smart objects and the need to guarantee them a great autonomy. For this purpose, the definition of trust and reputation mechanisms appears crucial. At the same time, several researchers have started to adopt a common distributed ledger, such as a Blockchain, for building advanced solutions in the IoT. However, due to the high dimensionality of this problem, enabling a trust and reputation mechanism by leveraging a Blockchain-based technology could give rise to several performance issues in the IoT. In this paper, we propose a two-tier Blockchain framework to increase the security and autonomy of smart objects in the IoT by implementing a trust-based protection mechanism. In this framework, smart objects are suitably grouped into communities. To reduce the complexity of the solution, the first-tier Blockchain is local and is used only to record probing transactions performed to evaluate the trust of an object in another one of the same community or of a different community. Periodically, after a time window, these transactions are aggregated and the obtained values are stored in the second-tier Blockchain. Specifically, stored values are the reputation of each object inside its community and the trust of each community in the other ones of the framework. In this paper, we describe in detail our framework, its behavior, the security model associated with it and the tests carried out to evaluate its correctness and performance.
13. A. Amelio, G. Bonifazi, E. Corradini, M. Marchetti, D. Ursino, L. Virgili, "Mapping and Compressing a Convolutional Neural Network through a Multilayer Network", SEBD 2022, 2022.
This paper falls in the context of the interpretability of the internal structure of deep learning architectures. In particular, we propose an approach to map a Convolutional Neural Network (CNN) into a multilayer network. Next, to show how such a mapping helps to better understand the CNN, we propose a technique for compressing it. This technique detects if there are convolutional layers that can be removed without reducing the performance too much and, if so, removes them. In this way, we obtain lighter and faster CNN models that can be easily employed in any scenario.
14. F. Cauteruccio, E. Corradini, G. Terracina, D. Ursino, L. Virgili, "Extraction and analysis of text patterns from NSFW adult content in Reddit", Data Knowledge Engineering, 2022.
Reddit is one of the few social networks that handles Not Safe For Work (NSFW) content in an explicit and well-structured way. Despite this, in the past literature on Reddit, there are very few researches concerning this topic. In particular, a study on the text of NSFW comments and posts published in this social medium is missing. In this paper, we aim at contributing to fill this gap

by proposing an approach for extracting and analyzing text patterns from NSFW adult content in Reddit. Some peculiarities of our approach are the following: (i) text patterns are extracted based not only on frequency but also, and mostly, on several utility measures; (ii) extracted patterns contribute to the definition of social networks whose analysis allows us to extract several useful information about the users publishing and/or accessing NSFW content and the language adopted by them; (iii) our approach is not only descriptive but also predictive, because, in addition to identifying already existing user communities, it is able to propose new ones; these are made up of users who do not yet know each other but share the same interests and the same language.

15. E. Corradini, G. Porcino, A. Scopelliti, D. Ursino, L. Virgili, "Fine-tuning SalGAN and PathGAN for extending saliency map and gaze path prediction from natural images to websites", Expert Systems and Applications, 2022.
    In recent years, researches dealing with the study of visual attention have become very popular thanks to the enormous increase of Artificial Intelligence. Machine Learning and, in particular, Deep Learning allowed researchers to propose new predictive models operating on natural images. In the meantime, an increasing number of websites has been made available on the Internet. However, few approaches, aiming at extending the results obtained on natural images to web pages, have been proposed. In this paper, we provide a contribution in this setting by applying fine-tuning and other refinements to two existing GAN-based approaches (i.e., SalGAN and PathGAN) originally proposed to predict the saliency maps and gaze paths on natural images. Our ultimate goal is defining some variants of them able to deal with websites. In particular, our SalGAN variant represents one of the first attempts to employ GANs for saliency map prediction on web pages, whereas our PathGAN variant is the first attempt to adopt GANs for gaze path prediction on websites Here, we present our proposals, highlight their main novelties, describe the tests done and the results obtained. We also highlight two further contributions of this paper, namely: (i) a new dataset, more complete than the existing ones, supporting the analysis of visual attention on websites, and (ii) a tool supporting a web page designer in her attempt to increase the visitor interest and curiosity.
16. G. Bonifazi, F. Cauteruccio, E. Corradini, M. Marchetti, G. Terracina, D. Ursino, L. Virgili, "Representation, detection and usage of the content semantics of comments in a social platform", Journal of Information Science, 2022.
    The analysis of people's comments in social platforms is a widely investigated topic because comments are the place where people show their spontaneity most clearly. In this paper, we present a network-based data structure and a related approach to represent and manage the underlying semantics of a set of comments. Our approach is based on the extraction of text patterns that take into account not only the frequency but also the utility of the analyzed comments. Our data structure and approach are "multi-dimensional" and "holistic", in the sense that they can simultaneously handle content semantics from multiple perspectives. They are also easily extensible, because additional content semantics perspectives can be easily added to them. Furthermore, our approach is able to evaluate the semantic similarity of two sets of comments. In this paper, we also illustrate the results of several tests we conducted on Reddit comments, even if our approach can be applied to any social platform. Finally, we provide an overview of some possible applications of this research.
17. G. Bonifazi, F. Cauteruccio, E. Corradini, M. Marchetti, A. Pierini, G. Terracina, D. Ursino, L. Virgili, "An approach to detect backbones of information diffusers among different communities of a social platform", Data & Knowledge Engineering, 2022.
    Information diffusion in social networks is a classic and, at the same time, very current problem. In fact, information diffusers are always looking for new techniques to disseminate information of their interest by creating backbones among them. In this paper, we focus on a specific, but very current and relevant, scenario regarding this way of proceeding. In fact, we propose an approach for the detection of possible backbones of information diffusers among different communities of a social network. Our approach is based on a new centrality measure that we call disseminator centrality. It is specifically designed to detect the so-called disseminator bridges, i.e., users belonging to multiple communities of a single social network, who want to disseminate information of their interest from one community to another by supporting each other. This paper describes the proposed approach, presents the disseminator centrality, illustrates the differences with respect to the related literature and presents the results of the experiments carried out to evaluate its performance.
18. G. Bonifazi, S. Cecchini, E. Corradini, L. Giuliani, D. Ursino, L. Virgili, "Investigating community

evolutions in TikTok dangerous and non-dangerous challenges", Journal of Information Science, 2022.
In just few years, TikTok has become a major player in the social media environment, especially with regard to teenagers. One of the key factors of this success is the idea of challenges, that is, video competitions/emulations on a certain topic, which a user can launch and other ones can join. Most of the challenges are fun and harmless. However, there are also users who launch challenges that are dangerous, or at least suitable only for an adult audience (and TikTok is the most popular social network for teenagers). This article focuses primarily on this kind of challenge. In particular, it investigates an aspect not yet studied in the literature, which is the different characteristics and evolutionary dynamics of the communities of users participating in non-dangerous and dangerous challenges. Its final goal is the identification of evolutionary patterns that distinguish the communities of users participating in the two types of challenges. The knowledge of these patterns could be a first step in implementing an approach to the early detection of dangerous challenges in TikTok.

19. G. Bonifazi, E. Corradini, D. Ursino, L. Virgili, "New Approaches to Extract Information from Posts on COVID-19 Published on Reddit", International Journal of Information Technology and Decision Making, 2022.
In the last two years, we have seen a huge number of debates and discussions on COVID-19 in social media. Many authors have analyzed these debates on Facebook and Twitter, while very few ones have considered Reddit. In this paper, we focus on this social network and propose three approaches to extract information from posts on COVID-19 published in it. The first performs a semi-automatic and dynamic classification of Reddit posts. The second automatically constructs virtual subreddits, each characterized by homogeneous themes. The third automatically identifies virtual communities of users with homogeneous themes. The three approaches represent an advance over the past literature. In fact, the latter lacks studies regarding classification algorithms capable of outlining the differences among the thousands of posts on COVID-19 in Reddit. Analogously, it lacks approaches able to build virtual subreddits with homogeneous topics or virtual communities of users with common interests.
20. G. Bonifazi, B. Breve, S. Cirillo, E. Corradini, L. Virgili, "New Approaches to Extract Information from Posts on COVID-19 Published on Reddit", Information Processing & Management, 2022.
Modeling discussions on social networks is a challenging task, especially if we consider sensitive topics, such as politics or healthcare. However, the knowledge hidden in these debates helps to investigate trends and opinions and to identify the cohesion of users when they deal with a specific topic. To this end, we propose a general multilayer network approach to investigate discussions on a social network. In order to prove the validity of our model, we apply it on a Twitter dataset containing tweets concerning opinions on COVID-19 vaccines. We extract a set of relevant hashtags (i.e., gold-standard hashtags) for each line of thought (i.e., pro-vaxxer, neutral, and anti-vaxxer). Then, thanks to our multilayer network model, we figure out that the anti-vaxxers tend to have ego networks denser (+14.39%) and more cohesive (+64.2%) than the ones of pro-vaxxer, which leads to a higher number of interactions among anti-vaxxers than pro-vaxxers (+393.89%). Finally, we report a comparison between our approach and one based on single networks analysis. We prove the effectiveness of our model to extract influencers having ego networks with more nodes (+40.46%), edges (+39.36%), and interactions with their neighbors (+28.56%) with respect to the other approach. As a result, these influential users are much more important to analyze and can provide more valuable information.
21. A. Amelio, G. Bonifazi, E. Corradini, S. Di Saverio, M. Marchetti, D. Ursino, L. Virgili, "Defining a deep neural network ensemble for identifying fabric colors", Applied Soft Computing, 2022.
Colors characterize each object around us. For this reason, the study of colors has played a key role in Artificial Intelligence (think, for instance, of image classification, object recognition and segmentation). However, there are some topics about colors still little explored. One of them concerns fabric colors. This is a particular topic since fabrics have some characteristics, such as specific textures, that are not found in other contexts. In this paper, we want to propose a new Convolutional Neural Network (CNN) based model for identifying fabric colors. After introducing this model, we consider three different versions of it and create an ensemble of the corresponding CNNs to get better results. Finally, through a series of experiments, we show that our ensemble is able to improve the state-of-the-art on the identification of fabric colors.
22. G. Bonifazi, F. Cauteruccio, E. Corradini, M. Marchetti, L. Sciarretta, D. Ursino, L. Virgili, "A

Space-Time Framework for Sentiment Scope Analysis in Social Media", Big Data and Cognitive Computing, 2022.
The concept of scope was introduced in Social Network Analysis to assess the authoritativeness and convincing ability of a user toward other users on one or more social platforms. It has been studied in the past in some specific contexts, for example to assess the ability of a user to spread information on Twitter. In this paper, we propose a new investigation on scope, as we want to assess the scope of the sentiment of a user on a topic. We also propose a multi-dimensional definition of scope. In fact, besides the traditional spatial scope, we introduce the temporal one, which has never been addressed in the literature, and propose a model that allows the concept of scope to be extended to further dimensions in the future. Furthermore, we propose an approach and a related set of parameters for measuring the scope of the sentiment of a user on a topic in a social network. Finally, we illustrate the results of an experimental campaign we conducted to evaluate the proposed framework on a dataset derived from Reddit. The main novelties of this paper are: (i) a multi-dimensional view of scope; (ii) the introduction of the concept of sentiment scope; (iii) the definition of a general framework capable of analyzing the sentiment scope related to any subject on any social network.

23. F. Cauteruccio, E. Corradini, G. Terracina, D. Ursino, L. Virgili, "Investigating Reddit to detect subreddit and author stereotypes and to evaluate author assortativity", Journal of Information Science, 2020.
In recent years, Reddit has attracted the interest of many researchers due to its popularity all over the world. In this article, we aim at providing a contribution to the knowledge of this social network by investigating three of its aspects, interesting from the scientific viewpoint, and, at the same time, by analysing a large number of applications. In particular, we first propose a definition and an analysis of several stereotypes of both subreddits and authors. This analysis is coupled with the definition of three possible orthogonal taxonomies that help us to classify stereotypes in an appropriate way. Then, we investigate the possible existence of author assortativity in this social medium; specifically, we focus on co-posters, that is, authors who submitted posts on the same subreddit.
24. G. Bonifazi, E. Corradini, D. Ursino, L. Virgili, "Defining user spectra to classify Ethereum users based on their behavior", Journal of Big Data, 2022.
Purpose: In this paper, we define the concept of user spectrum and adopt it to classify Ethereum users based on their behavior. Design/methodology/approach: Given a time period, our approach associates each user with a spectrum showing the trend of some behavioral features obtained from a social network-based representation of Ethereum. Each class of users has its own spectrum, obtained by averaging the spectra of its users. In order to evaluate the similarity between the spectrum of a class and the one of a user, we propose a tailored similarity measure obtained by adapting to this context some general measures provided in the past. Finally, we test our approach on a dataset of Ethereum transactions. Findings: We define a social network-based model to represent Ethereum. We also define a spectrum for a user and a class of users (i.e., token contract, exchange, bancor and uniswap), consisting of suitable multivariate time series. Furthermore, we propose an approach to classify new users. The core of this approach is a metric capable of measuring the similarity degree between the spectrum of a user and the one of a class of users. This metric is obtained by adapting the Eros distance (i.e., Extended Frobenius Norm) to this scenario. Originality/value: This paper introduces the concept of spectrum of a user and a class of users, which is new for blockchains. Differently from past models, which represented user behavior by means of univariate time series, the user spectrum here proposed exploits multivariate time series. Moreover, this paper shows that the original Eros distance does not return satisfactory results when applied to user and class spectra, and proposes a modified version of it, tailored to the reference scenario, which reaches a very high accuracy. Finally, it adopts spectra and the modified Eros distance to classify Ethereum users based on their past behavior. Currently, no multi-class automatic classification approach tailored to Ethereum exists yet, albeit some single-class ones have been recently proposed. Therefore, the only way to classify users in Ethereum are online services (e.g., Etherscan), where users are classified after a request from them. However, the fraction of users thus classified is low. To address this issue, we present an automatic approach for a multi-class classification of Ethereum users based on their past behavior.
25. G. Bonifazi, S. Cecchini, E. Corradini, L. Giuliani, D. Ursino, L. Virgili, "Investigating Reddit to detect subreddit and author stereotypes and to evaluate author assortativity", Social Network

Analysis and Mining, 2022.
One of the key aspects that distinguish TikTok from other social media is the presence of challenges. A challenge is a kind of competition that starts when a user posts a video with certain actions and a certain hashtag and invites other users to replicate the same video in their own way. Most challenges are fun and harmless, but sometimes dangerous challenges are launched as well. The authors of these challenges use various tricks to bypass TikTok's controls. In this paper, we analyze the lifespans of some TikTok challenges and show how they are very different for non-dangerous and dangerous ones. Then, we deepen our analysis by identifying some time patterns that characterize the two types of challenges. Finally, we test the accuracy of the results obtained on a large set of challenges different from those used during the detection of time patterns. The focus of this paper is the detection of time patterns allowing the classification of challenges in dangerous and non-dangerous ones. This could represent a first step towards an approach for the early detection of dangerous challenges in TikTok.

26. A. Amelio, G. Bonifazi, E. Corradini, D. Ursino, L. Virgili, "A Multilayer Network-Based Approach to Represent, Explore and Handle Convolutional Neural Networks", Cognitive Computation, 2022.
Deep learning techniques and tools have experienced enormous growth and widespread diffusion in recent years. Among the areas where deep learning has become more widespread there are computational biology and cognitive neuroscience. At the same time, the need for tools able to explore, understand, and possibly manipulate, a deep learning model has strongly emerged. We propose an approach to map a deep learning model into a multilayer network. Our approach is tailored to Convolutional Neural Networks (CNN), but can be easily extended to other architectures. In order to show how our mapping approach enables the exploration and management of deep learning networks, we illustrate a technique for compressing a CNN. It detects whether there are convolutional layers that can be pruned without losing too much information and, in the affirmative case, returns a new CNN obtained from the original one by pruning such layers. We prove the effectiveness of the multilayer mapping approach and the corresponding compression algorithm on the VGG16 network and two benchmark datasets, namely MNIST, and CALTECH-101. In the former case, we obtain a 0.56% increase in accuracy, precision, and recall, and a 21.43% decrease in mean epoch time. In the latter case, we obtain an 11.09% increase in accuracy, 22.27% increase in precision, 38.66% increase in recall, and 47.22% decrease in mean epoch time. Finally, we compare our multilayer mapping approach with a similar one based on single layers and show the effectiveness of the former. We show that a multilayer network-based approach is able to capture and represent the complexity of a CNN. Furthermore, it allows several manipulations on it. An extensive experimental analysis described in the paper demonstrates the suitability of our approach and the goodness of its performance.
27. G. Bonifazi, F. Cauteruccio, E. Corradini, M. Marchetti, D. Montella, S. Scarponi, D. Ursino, L. Virgili, "Performing Wash Trading on NFTs: Is the Game Worth the Candle?", Big Data and Cognitive Computing, 2023.
Wash trading is considered a highly inopportune and illegal behavior in regulated markets. Instead, it is practiced in unregulated markets, such as cryptocurrency or NFT (Non-Fungible Tokens) markets. Regarding the latter, in the past many researchers have been interested in this phenomenon from an "ex-ante" perspective, aiming to identify and classify wash trading activities before or at the exact time they happen. In this paper, we want to investigate the phenomenon of wash trading in the NFT market from a completely different perspective, namely "ex-post". Our ultimate goal is to analyze wash trading activities in the past to understand whether the game is worth the candle, i.e., whether these illicit activities actually lead to a significant profit for their perpetrators. To the best of our knowledge, this is the first paper in the literature that attempts to answer this question in a "structured" way. The efforts to answer this question have enabled us to make some additional contributions to the literature in this research area. They are: (i) a framework to support future "ex-post" analyses of the NFT wash trading phenomenon; (ii) a new dataset on wash trading transactions involving NFTs that can support further future investigations of this phenomenon; (iii) a set of insights of the NFT wash trading phenomenon extracted at the end of an experimental campaign.
28. F. Cauteruccio, E. Corradini, M. Marchetti, D. Ursino, L. Virgili, "Applying Social Network Analysis to Model and Handle a Cross-Blockchain Ecosystem", Electronics, 2023.
In recent years, the huge growth in the number and variety of blockchains has prompted researchers to investigate the cross-blockchain scenario. In this setting, multiple blockchains coexist, and

wallets can exchange data and money from one blockchain to another. The effective and efficient management of a cross-blockchain ecosystem is an open problem. This paper aims to address it by exploiting the potential of Social Network Analysis. This general objective is declined into a set of activities. First, a social network-based model is proposed to represent such a scenario. Then, a multi-dimensional and multi-view framework is presented, which uses such a model to handle a cross-blockchain scenario. Such a framework allows all the results found in the past research on Social Network Analysis to be applied to the cross-blockchain ecosystem. Afterwards, this framework is used to extract insights and knowledge patterns concerning the behavior of several categories of wallets in a cross-blockchain scenario. To verify the goodness of the proposed framework, it is applied on a real dataset derived from Multichain, in order to identify various user categories and their "modus operandi". Finally, a new centrality measure is proposed, which identifies the most significant wallets in the ecosytem. This measure considers several viewpoints, each of which addresses a specific aspect that may make a wallet more or less central in the cross-blockchain scenario.

29. A. Amelio, G. Bonifazi, F. Cauteruccio, E. Corradini, M. Marchetti, D. Ursino, L. Virgili, "Representation and compression of Residual Neural Networks through a multilayer network based approach", Expert Systems with Applications, 2023.
In recent years different types of Residual Neural Networks (ResNets, for short) have been introduced to improve the performance of deep Convolutional Neural Networks. To cope with the possible redundancy of the layer structure of ResNets and to use them on devices with limited computational capabilities, several tools for exploring and compressing such networks have been proposed. In this paper, we provide a contribution in this setting. In particular, we propose an approach for the representation and compression of a ResNet based on the use of a multilayer network. This is a structure sufficiently powerful to represent and manipulate a ResNet, as well as other families of deep neural networks. Our compression approach uses a multilayer network to represent a ResNet and to identify the possible redundant convolutional layers belonging to it. Once such layers are identified, it prunes them and some related ones obtaining a new compressed ResNet. Experimental results demonstrate the suitability and effectiveness of the proposed approach.
30. G. Bonifazi, E. Corradini, D. Ursino, L. Virgili, "Modeling, Evaluating, and Applying the eWoM Power of Reddit Posts", Big Data and Cognitive Computing, 2023.
Abstract Electronic Word of Mouth (eWoM) has been largely studied for social platforms, such as Yelp and TripAdvisor, which are highly investigated in the context of digital marketing. However, it can also have interesting applications in other contexts. Therefore, it can be challenging to investigate this phenomenon on generic social platforms, such as Facebook, Twitter, and Reddit. In the past literature, many authors analyzed eWoM on Facebook and Twitter, whereas it was little considered in Reddit. In this paper, we focused exactly on this last platform. In particular, we first propose a model for representing and evaluating the eWoM Power of Reddit posts. Then, we illustrate two possible applications, namely the definition of lifespan templates and the construction of profiles for Reddit posts. Lifespan templates and profiles are ultimately orthogonal to each other and can be jointly employed in several applications.

4 Attività di ricerca

Da Dicembre 2020, Enrico Corradini ha preso parte allo sviluppo di un progetto in collaborazione con l'azienda BV Tech, con lo scopo di analizzare la sharing economy il comportamento della comunità.

Dal 28 Gennaio 2020 Enrico Corradini ha preso parte allo sviluppo di un Progetto di Machine Learning in collaborazione con Sinergia S.C.A.R.L.. Il progetto si è concentrato sullo sviluppo di un framework per il ridimensionamento del personale degli uffici dell'azienda in base al carico di lavoro.

Dal 10 Marzo 2020 Enrico Corradini ha preso parte allo sviluppo di un Progetto di Machine Learning e Manutenzione Predittiva in collaborazione con Sisal S.p.A.. Il progetto si è concentrato sullo sviluppo di un framework capace di prevedere il malfunzionamento dei terminali dell'azienda.

Dal 1 Ottobre 2020 collaborato al progetto Fermo-Tech. Lo scopo del progetto è stato quello di migliorare la presenza di alcune aziende sul territorio.

Dal 17 Febbraio 2021 Enrico Corradini ha collaborato allo sviluppo di un progetto di Machine Learning (SADABI-IT) in collaborazione con Fater S.p.A. Lo scopo del progetto è quello di analizzare nel dettaglio le vendite e le promozioni dell'azienda.

Dal 1 Marzo 2021 partecipa al progetto RicovAI, con lo scopo di analizzare e migliorare l'assistenza medica domiciliare durante la pandemia COVID-19.

Da Novembre 2020 partecipa al progetto MERCURY, in collaborazione Filippetti, il cui tema era l'Industry 4.0.

Da Novembre 2020 a Maggio 2021 ha partecipato al progetto SafeLife, che prevedeva lo sviluppo di un'app e del relativo sistema per la gestione dei pericoli in città.

Da Settembre 2021, Enrico Corradini ha effettuato molteplici revisioni di articoli per diversi journal, tra cui Multimedia Tools and Applications e Journal of Information Science.

Da Settembre 2021 ha partecipato alla ricerca e allo sviluppo di un progetto Machine Learning in collaborazione con Xplace, per l'analisi e lo studio di campagne di influencer marketing.

Da Marzo 2022 ha partecipato alla stesura del bando per il PRIN 2022, presentando un progetto denominato HOMEY.

Da Aprile 2022, Enrico Corradini ha partecipato alla ricerca e allo sviluppo di un progetto Machine Learning in collaborazione con Biesse, su manutenzione predittiva e Industry 5.0.

Da Maggio 2022, ha partecipato alla ricerca e allo sviluppo di un progetto di Intelligenza Artificiale in collaborazione con l'Università Mediterranea di Reggio Calabria, sul tema delle infrastrutture strategiche.

4.1 Organizzazione o partecipazione a conferenze nazionali o internazionali

Dal 13 al 17 Gennaio 2020 ha partecipato alla Winter School per dottorandi BigDat, svoltasi presso l'Università Politecnica delle Marche. Durante questo evento ha potuto seguire corsi riguardo i Big Data tenuti da professori di fama internazionale.

Dal 21 Giugno 2020 al 24 Giugno 2020, Enrico Corradini ha partecipato a "28th Symposium on Advanced Database Systems (SEBD2020)".

Dal 13 Luglio 2021 al 16 Luglio 2021 ha partecipato alla PhD Summer School SSIE 2021 e seguito talk su Machine Learning e Deep Learning.

Dal 5 Settembre 2021 al 9 Settembre 2021 ha partecipato alla conferenza nazionale SEBD 2021, presentando il discussion paper "An investigation on not safe for work adult content in Reddit".

Da Febbraio 2021, ricopre il ruolo di Publicity Chair per la conferenza VIPERC 2022.

Enrico Corradini ha fatto parte del Program Committee della conferenza SEBD 2022.

Enrico Corradini ha fatto parte dell'Organization Committee del Workshop HIEMI 2022.

5 Premi e riconoscimenti

Nei giorni 20 e 21 ottobre 2017, Enrico Corradini ha partecipato all'Hackathon organizzato da *Ecapital* in collaborazione con *IBM* presso l'*Università Politecnica della Marche*. La sua squadra è arrivata seconda con il progetto "Clever Plug", una presa in grado di rilevare il consumo di corrente elettrica insieme ad un sistema composto da centralina, database ed applicazione Android in grado di ottenere i dati da tutte le prese.

In Novembre 2021, Enrico Corradini ha vinto il premio "Excellent Student Award", del valore di 5.000$ al concorso Huawei AppsUP 2021. Tale concorso, indetto da Huawei, prevedeva lo sviluppo di un'applicazione che integrasse i servizi mobili Huawei.

In Dicembre 2022, Enrico Corradini ha vinto il premio "Excellent Student Award", del valore di 5.000$ al concorso Huawei AppsUP 2022.

6 Competenze

6.1 Competenze tecniche

Nel corso degli anni, Enrico Corradini ha acquisito le seguenti competenze tecniche:

- Data Analysis e Big Data:
  - Pandas;
  - Networkx;
  - scikit-learn;

    - librerie Python per il Machine Learning.
- Linguaggi di programmazione:
    - Java;
    - Dart;
    - C;
    - C++;
    - Swift;
    - Python;
    - Visual C#;
    - HTML;
    - Javascript;
    - PL/SQL;
    - Perl.
- Programmazione Mobile:
    - Android;
    - Apple iOS;
    - Flutter;
    - Microsoft Windows UWP.
- Sistemi Operativi:
    - Windows;
    - Linux;
    - macOS.
- DBMS relazionali:
    - MySQL;
    - Oracle DB;
    - SQLite;
    - Microsoft SQL Server.
- DBMS NoSQL:
    - Firebase Database;
    - Firestore;
    - Azure Data Lake;
    - Kylo Data Lake.
- Ulteriori conoscenze ICT:
    - Cybersecurity;
    - Computer Vision;
    - Machine Learning;
    - Data Mining;
    - Process Mining;
    - Software Design;
    - Kernel Linux;
    - Git versioning control.
- Tool:
    - Microsoft Azure;
    - Microsoft PowerBI;
    - Qlik;
    - Tableau;
    - IBM Watson;
    - Gephi
    - Android Studio;
    - XCode;
    - Visual Studio;
    - Rapid Miner Studio;
    - ProM;
    - Oracle Forms;
    - Caffe;
    - Tensorflow;
    - Google MLKit.

6.2 Competenze linguistiche

Enrico Corradini ha conseguito una certificazione di conoscenza della lingua inglese di livello B2, i cui dettagli sono di seguito specificati.

- Comprensione:
  - Ascolto: B2;
  - Lettura: B2.
- Parlato:
  - Interazione: B2;
  - Produzione orale: B2.
- Produzione Scritta: B2

In allegato la certificazione *Cambridge B2 First.*
Nel 2013 ha frequentato un corso in preparazione alla certificazione *Cambridge C1 Advanced.*

Nell'ottobre 2020, Enrico Corradini, ha completato un corso di Cinese base, livello HSDK1, sulla piattaforma Coursera. Il corso era fornito dall'Università di Pechino.

6.3 Competenze comunicative

Enrico Corradini presenta una spiccata capacità di ascolto, è sempre disponibile all'apprendimento di nuove conoscenze e al confronto con idee differenti. Predilige lavorare con altre persone ed ha buone capacità di gestione ed organizzazione del lavoro di gruppo. Ha avuto modo di conoscere diversi aspetti di gestione e direzione del lavoro di gruppo durante il periodo trascorso in azienda nonché durante i vari progetti svolti nel periodo di formazione e tirocinio.

7 Sistemi Commerciali realizzati

Da Giugno 2018, Enrico Corradini è sviluppatore autonomo di applicazioni Android ed iOS. Svariate di queste sono pubblicate sul Google Play Store, sull'Apple App Store e su Huawei AppGallery, alcune di esse si sono dimostrate di grande successo. Maggiori informazioni su tali applicazioni si possono trovare visitando il sito web `https://www.peoplendroid.it`.

8 Interessi di ricerca

Il principale tema di cui si occupa Enrico Corradini è Social Network Analysis. La sua attività di ricerca è incentrata sulla modellazione formale delle reti sociali e sull'analisi delle loro dinamiche, spesso utilizzando tecniche di machine learning e deep learning. Grazie alla sua esperienza, Corradini ha sviluppato una profonda conoscenza delle reti sociali reali, delle loro caratteristiche e delle modalità con cui le informazioni si diffondono all'interno di esse. In particolare, Corradini ha svolto numerosi lavori riguardanti la Network Analysis e la Social Network Analysis, focalizzandosi sulla definizione di concetti come "utente bridge" e "influencer" per comprendere come le informazioni si diffondono all'interno delle diverse comunità di un Social Network. Questo approccio si è rivelato molto utile per identificare le dinamiche di comunicazione all'interno di una rete e per comprendere come tali dinamiche possano essere utilizzate per migliorare la moderazione di una rete.

Grazie alla sua esperienza, Enrico Corradini ha anche esteso questi concetti alle reti di smart objects, come l'IoT e il Multi-IoT. In questo contesto, ha introdotto il concetto di oggetti che possono fungere da "bridge" tra diverse reti indipendenti, parzialmente sovrapposte. Questo ha portato ad una serie di problematiche di ricerca da esplorare, come la progettazione e l'implementazione di crawler ad hoc per il Multi-IoT, la definizione di nuove forme di centralità che tengano conto del ruolo dei cross-node e la definizione di un "profilo" di un oggetto e sistemi di raccomandazione di oggetti ad altri oggetti.

Il concetto di Multi-IoT deriva dall'estensione, al mondo delle "cose", dell'evoluzione concettuale che si è avuta, nel contesto delle social network, quando si è passati dal "Social Networking", in cui si analizzava una sola social network alla volta, al "Social Internetworking", laddove vegono analizzate più social network che interagiscono tra di loro grazie alla presenza di alcuni utenti iscritti a più

network e che fungono da bridge. Nella letteratura scientifica, da pochissimi anni, si è cominciato a discutere di "Social IoT" (SIoT), ovvero di un contesto IoT in cui gli oggetti coinvolti possono mostrare un comportamento sociale. Tuttavia, nel SIoT, gli oggetti sono ancora organizzati in un'unica grande rete globale. Il Multi-IoT eredita dal SIoT l'idea che gli oggetti possano essere "social". In aggiunta, però, introduce l'idea che essi possano essere organizzati in reti indipendenti, parzialmente sovrapposte (attraverso i "bridge"), che interagiscono tra di loro. Inoltre, Enrico Corradini ha sviluppato tecniche di trust e reputation per gli oggetti, nonché tecniche per l'individuazione di anomalie in un contesto Multi-IoT e predictive maintenance in un contesto di produzione e manifatturiero.

È interessante notare che tutti questi concetti possono essere estesi a tecniche di programmazione mobile che in genere si usano per i dispositivi mobili. Da questo punto di vista, potrebbe risultare estremamente preziosa la conoscenza della programmazione mobile che Enrico Corradini ha acquisito realizzando i sistemi commerciali descritti nella Sezione 7.

Ancona, 5 giugno 2023

Enrico Corradini

Si autorizza il trattamento dei dati personali, secondo quanto previsto dalla Legge 196/03.