

De 51016

Quesito 1

È possibile misurare in real time le emissioni tail-pipe dei veicoli circolanti in un ambito urbano? Se sì, come ne utilizzerebbe i dati ottenuti?

Quesito 2

Se dovesse introdurre delle limitazioni alla circolazione veicolare in una zona urbana che strategie utilizzerebbe e come ne misurerebbe e monitorerebbe gli esiti in termini di inquinamento?

Quesito su conoscenze informatiche

Il candidato descriva vantaggi e criticità di un ambiente cloud di office automation a fini di gestione della collaborazione in un gruppo di lavoro.

Testo in lingua inglese

Industry 4.0, referred to as the "Fourth Industrial Revolution", also known as "smart manufacturing", "industrial internet" or "integrated industry", is currently a much-discussed topic that supposedly has the potential to affect entire industries by transforming the way goods are designed, manufactured, delivered and payed. This paper seeks to discuss the opportunities of Industry 4.0 in the context of logistics management, since implications are expected in this field. The authors pursue the goal of shedding light on the young and mostly undiscovered topic of Industry 4.0 in the context of logistics management, thus following a conceptual research approach. At first, a logistics-oriented Industry 4.0 application model as well as the core components of Industry 4.0 are presented. Different logistics scenarios illustrate potential implications in a practice-oriented manner and are discussed with industrial experts. The studies reveal opportunities in terms of decentralisation, self-regulation and efficiency. Moreover, it becomes apparent that the concept of Industry 4.0 still lacks a clear understanding and is not fully established in practice yet. The investigations demonstrate potential Industry 4.0 implications in the context of Just-in-Time/Just-in-Sequence and cross-company Kanban systems in a precise manner. Practitioners could use the described scenarios as a reference to foster their own Industry 4.0 initiatives, with respect to logistics management.

Giochi

Quesito 1

Quali implicazioni tecnologiche comporterebbero l'invio e la ricezione di dati tra veicoli e ambiente al fine di una riduzione dell'impatto ambientale di flotte veicoli di consegne a domicilio o di raccolta di rifiuti?

Quesito 2

In cosa consistono i controlli sui sistemi di post-trattamento dei gas di scarico dei veicoli dotati di motori a combustione?

Quesito su conoscenze informatiche

Il candidato descriva le potenzialità e le criticità nell'utilizzo di soluzioni di edge computing nell'acquisizione e nell'utilizzo di dati provenienti da un veicolo.

Testo in lingua inglese

Industry 4.0 has been considered a new industrial stage in which several emerging technologies are converging to provide digital solutions. However, there is a lack of understanding of how companies implement these technologies. Thus, we aim to understand the adoption patterns of Industry 4.0 technologies in manufacturing firms. We propose a conceptual framework for these technologies, which we divided into front-end and base technologies. Front-end technologies consider four dimensions: Smart Manufacturing, Smart Products, Smart Supply Chain and Smart Working, while base technologies consider four elements: internet of things, cloud services, big data and analytics. We performed a survey in 92 manufacturing companies to study the implementation of these technologies. Our findings show that Industry 4.0 is related to a systemic adoption of the front-end technologies, in which Smart Manufacturing plays a central role. Our results also show that the implementation of the base technologies is challenging companies, since big data and analytics are still low implemented in the sample studied. We propose a structure of Industry 4.0 technology layers and we show levels of adoption of these technologies and their implication for manufacturing companies.

Quesito 1

Quali sistemi consentono il controllo delle emissioni inquinanti engine-out della maggior parte dei veicoli attualmente circolanti in ambito urbano?

Quesito 2

Possono le tecnologie di edge computing agevolare un utilizzo più consapevole di stili di guida meno impattanti sull'ambiente? Se ne illustrino opportunità e/o criticità.

Quesito su conoscenze informatiche

Il candidato descriva le modalità per la creazione e la gestione di un dataset complesso (costituito p. es. da più files) e integrato, basato su Excel.

Testo in lingua inglese

Over the last two decades, a concept called Digital Twin has evolved rapidly. Yet, there is no unified definition of the term. Based on a literature study and an industrial case study, an overarching definition of Digital twins is presented. Three characteristics were identified – representation of a physical system, bidirectional data exchange, and the connection along the entire lifecycle. Further, three sub-concepts are presented, namely: Engineering Twin, Production Twin, and Operation Twin. The presented paper thus formulates a consistent and detailed definition of Digital Twins.

In the last decade, companies of all sizes, all around the globe are facing ever more fast-paced, uncertain, and complex boundary conditions. A driver of this phenomenon is the growing digitization forcing companies to develop more cost- and time-efficiently. On the other hand, digital or virtual engineering also enables companies to cope with these challenges (Hanschke, 2018). In the course of this trend, a theory called Digital Twin has developed over the last two decades. The term describes the virtual representation of a physical system. In the beginning, Digital Twins were merely descriptive, but as computational and information and communication technologies evolved, it became possible to establish a bidirectional coupling between the digital and the physical system (Grieves and Vickers, 2017). Since its basic idea in 2002, the relevance of Digital Twins has grown increasingly. In a workshop with 40 Swedish industrial and academic experts, Eckert et al. (2019) identified “complete integrated twins” as one of the major industry trends to 2040.

Quesito 1

Cosa riterrebbe di maggior rilevanza nella individuazione di dataset di variabili da monitorare in grado di contenere la CO₂ del traffico cittadino? E da quali veicoli ne riterrebbe più necessaria l'acquisizione?

Quesito 2

Se dovesse individuare una modalità di selezione tra diversi percorsi da effettuare in un dato ambito urbano per i veicoli di una flotta di consegne a domicilio dotati di tecnologie IoV, quali priorità adotterebbe al fine di ridurre l'impatto ambientale?

Quesito su conoscenze informatiche

Il candidato descriva i criteri per la creazione di una efficace visualizzazione di esiti di post-elaborazione di dati sperimentali.

Testo in lingua inglese

In recent years, the Internet of Things (IoT) has emerged as a new opportunity. Thus, all devices such as smartphones, transportation facilities, public services, and home appliances are used as data creator devices. All the electronic devices around us help our daily life. Devices such as wrist watches, emergency alarms, and garage doors and home appliances such as refrigerators, microwaves, air conditioning, and water heaters are connected to an IoT network and controlled remotely. Methods such as big data and data mining can be used to improve the efficiency of IoT and storage challenges of a large data volume and the transmission, analysis, and processing of the data volume on the IoT. The aim of this study is to investigate the research done on IoT using big data as well as data mining methods to identify subjects that must be emphasized more in current and future research paths. This article tries to achieve the goal by following the conference and journal articles published on IoT-big data and also IoT-data mining areas between 2010 and August 2017. In order to examine these articles, the combination of Systematic Mapping and literature review was used to create an intended review article. In this research, 44 articles were studied. These articles are divided into three categories: Architecture & Platform, framework, and application. In this research, a summary of the methods used in the area of IoT-big data and IoT-data mining is presented in three categories to provide a starting point for researchers in the future.

Quesito 1

Da quali fonti derivano le misure di particolato che si ottengono dalle centraline distribuite nelle città? E' possibile fare delle correlazioni tra tali misure e dati ricavabili direttamente da un veicolo? Se sì, come?

Quesito 2

Come può essere reso operativo l'invito ad un consapevole stile di guida atto a limitare le emissioni e i consumi di un veicolo? (dispositivi, misure, limiti, criticità, monitoraggio).

Quesito su conoscenze informatiche

Il candidato descriva modalità e strumenti per integrare dati provenienti da fonti differenti a fini di post-elaborazione

Testo in lingua inglese

In developing countries, modern society has serious problems with transportation systems. Automotive manufacturers are actively advancing vehicle technologies and applications across multiple domains, encompassing traffic management and information systems. This involves the integration of vehicles with various technologies, sensors, and surveillance cameras. Smart cities and advanced transportation systems can utilize their ability to sense and communicate. The need to integrate a wide range of technologies and application domains is a result of the diverse daily activities managed using various applications, which in turn presents new challenges. The primary goal of this manuscript is to develop an application that utilizes Dijkstra's algorithm to connect navigation applications with taxi company applications, thereby enabling users to compare companies based on their carbon emissions levels. This application allows smartphone users to schedule their requests for taxi companies' applications during peak hours of the week. This application can develop and organize public transportation and private transportation services in a way that suits users' needs. In the long run, the desired benefits of this application are a reduction in time, pollution, and fuel expenses, as well as the ability to filter results based on their preferences, such as cost, environmental impact, or travel time.