Air Pollution Analysis Using Ontologies and Regression Models

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Abstract
Rapidly throughout the world economy, "the expansive Web" in the "world" explosive growth, rapidly growing market characterized by short product cycles exist and the demand for increased flexibility as well as the extensive use of a new data vision managed data society: society. A new socio-economic system that relies more and more on movement, allocation and results data whose daily existence, refinement, economy and adjust the exchange industry. Cooperative Engineering Co - operation and multi -disciplinary installed on people's cooperation is a good example. Semantic Web, is a new form of Web content that is meaningful to computers, and additional approved another example. Communication, vision sharing and exchanging data Society's new commercial bet. Urban air pollution modeling and data processing techniques need elevated Association. Artificial intelligence in countless ways and breakthrough technologies that can solve environmental problems from uneven offers. A method for data to formal ontology means a true meaning and lack of ambiguity to allow us to portray memo. In this work we survey regression model for ontologies and air pollution.

Keywords:
Ontologies, Air pollution Analysis, Regression Models, Linear Regression.

1. Introduction

The term "ontology" Data Science and research in 1990 across countless man-made intelligence (AI) research community has to. AI researchers have adopted the term "ontology" is usually depicted in a scheme to code they even (from the stand point of the computational aspects) should be a fair representation of the world

An ontology is a fair; a public explanation of the concept is clear. A "concept" of an event, the event is prepared by identifying the relevant considerations of a hypothetical ideal. Ideas, relationships between them and the constraints on their use are clearly defined. "Formal" way of ontology languages and always involves the use of machine-readable. For example, in the areas of health, disease and symptom of ideas, they are the relationship between cause and not just a nuisance that can cause a disease.

An ontology is a "share" concept that the use of ontologies for the target group aimed to embody the vision of consensus. Ideally ontology terms for its use independently and in a way that the public may be universal, but useful functions arrest uneven and unequal representation of vision calls for an ontology uses.

Meaning how ontologies are helpful in data recovery? Budding accelerated digitization processes and globally relevant databases that are transpiring in the current year, the focus of the problems of data is modified. This matter is now the subject of a precise vision to find the data and commands, but only the most relevant agents is difficult to choose from the huge piles of data. Such a syntactic conventional engine, hunting for keywords, and its abundance by data elements in order to explore the processes in place to use. A situation that relevant data, including but not a precise data object is different because it uses words to portray - - These methods suffer from setbacks such as terminology inconsistency and "contrast" that irrelevant data because of the similarities in wording has been taken.

Recently, however, is moving in a new way - meaning approach. Data about data - - order an additional satisfactory method for data retrieval and exploration of those "need to answer this is to use meta data.

Ontologies are two ways this can be very useful in improving the process:

1. It allows to abstract the information and represent it explicitly- highlighting the concepts and relations and not the words used to describe them. [1]
2. Ontologies can possess inference functions, allowing more intelligent retrieval. For example, a "basketball player" is also a "professional athlete", and an Ontology that defines the relations between these concepts can retrieve one when the other is queried.

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2. What Is Ontology?

"Although the ontology is currently a fashionable word, there is no agreement on the precise meaning of the term: it is reported that the main purpose of the ontology is to regulate the meaning of words, the term" ontology "is not clearly defined humorous "and" concerning AI (Artificial Intelligence) to produce a lot of controversy in the discussion "feel. F karma, vision and multimedia ontology engineering request finds applicability in many areas, and each one of them has its own meaning.

2.1 A bit of etymology and philosophy.

The term "ontology" last a very long time in philosophy, starting with the works of Aristotle. As being "science", from the Greek "ontos" This way both speech and reason for being and "Logo" is described. Ontology is the division of metaphysics that deals with the nature of being is next. From the point of thinking about the event, an additional current philosophy is to start with German theorists of the 19th century, the existence of an ontology is a systematic report. This idea does not mean different things back (phenomenological approach) are going to be and despite the appearance, these are two ways that cannot be included (phenomenological reduction concerning contemplate). To keep in mind, the larger epistemological sense can help us to understand what must be ontology. Vision, language and reasoning: As a matter of fact, one can maintain three dimensions. In other words: to clear speech about the world, to manipulate our understanding and representation throughout the world to understand the concept.

2.2 The knowledge engineering point of view.

Multimedia and vision engineering sectors nineties instead of a systematic nature, a spiritual way of being able to focus more on early reports of the presence of 1 used the word ontology. As a matter of fact, man-made system of intelligence, what exists is a declarative language that can be embedded in. Ontology next how objects, ideas and connections in a short period of interest are agreeing to continue to embody a clear specification is appropriate. Gruber shouted ideas and connections that it is an agent or agents can continue for a description of the area (a program like a reasonable specification) that "the concept of a specification is". The definition of terms used in engineering include semantic web, we can say that to begin again: "An ontology is a computer-readable language to express ideas in a common description of the connection." Fig. 1is an example of general higher ontology.

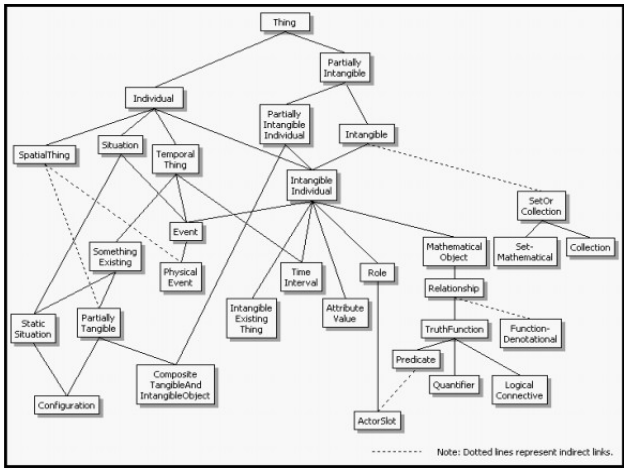

Figure 1: The Upper Ontology

3. What Is Ontology For ?

"What is vital is what ontology is for" (T.R Gruber). As a matter of fact, the ontology's necessities depend on the intention of the final application. The main goal of an ontology is to enable contact and vision allocating amid computer arrangements by seizing a public understanding of words that can be utilized by humans and programs. We can next recognize disparate groups of uses for ontologies:

- communication amid people and organizations;
- inter -operability (communication) amid arrangements, including enterprise modeling and multi agent arrangements;
- system engineering, for specification, reliability and reusability;
- knowledge association like data retrieval, document association, vision center systems;
- natural speech treatment for semantic research, lexical construction;

In connection with all requests and Internet electronic transactions and the semantic web. We are well past the one that shows the trend of the real ontology allow inadequate word to say. Confronting the increasing use of the web, additional human and computer programs to

interact with the demand for data on websites. Described as an extension of the current one, a new form of web content was necessary. "Semantic web is a representation of the globe vast web of data". (W3C's definition). Semantic Web on Resource Description Framework (RDF) for words, XML for syntax and URIs for shouting has been established.

4. Air Pollution

Air pollution and prepare for every metropolis outstanding importance for nature is an environmental shock. And in the industry spans the development of motor-car traffic over the past year has been the severity of the situation. Numerous authors and institutions to solve the problem of air pollution in the disturbances. Emissions of pollutants that affect air quality, air quality, very much. Lung infections and a high degree of air pollution, with spans of respiratory diseases in the population decline of the sensitivity of the air quality reasons. Car density and air pollution caused by the industry, cars and industry emissions, depending on the type of uneven geographical location, such as temperature, wind conditions, according to the weather conditions, and complementary factors. For the determination of air pollution emissions, the dense monitoring systems are working in many areas of the city. Intended area of monitoring indoor air quality is to inform about the powers accountable. Surveillance data from shock and such small words to solve the contamination level forecasting, emergency response measures, deciding to eliminate air pollution in the form of work is used by experts

Decision-making, has been installed on quantitative data and measurements and observations, presented data concerning the frequency and size of the change and whether standards are maintained from the beginning is consolidated for cooperation in air quality decision support to offer an unfailing, a mathematical model has to be designed, environmental protection and air pollution (CO, CO2, mist, SO2, etc.) between connection established. Obviously, there are unforeseen factors that could impact the degree of air pollution are a lot of, and it is certain that the institution due to a cut or an increase of air pollutants are difficult pointer. Install heavy numerical modeling methods and computational resources when running complex data that often are not attainable need to rush. Artificial intelligence methods, expert systems and knowledge-based methods that employ the very way in this area not only enthusing. The success of these methods are used in various fields of science. Environmental Law Association and the Association of air quality models and data processing components and modules encompass blow to solve. A knowledge-based numerical model is an alternative route proposal, a vision center is an inference engine that can deal with uncertainty in terms of use by many original features. An ontology way, employing a consistent, coherent and non-redundant central vision can be estimated.

5. Urban Air Quality Monitioring

Wise accurate environmental data, uneven metropolitan locations, the resort affords elevated alarm system possible scenarios and to advocate appropriate countermeasures should notice. Mobility is possible to exploit the inherent web nodes, consequently, a low cost environmental monitoring system with high spatial coverage to apply. With a vehicular sensor web in potential environmental data collectable, air quality plays a secondary role. It's really a major concern in modern cities because of air pollution on human health and the environment is an important encounter.

Local factors, the city's terms, and conditions hot spot: the air quality in the city spread is the result of three factors. In rural spans, pollution levels with medium to long-distance voyaging complementary areas of air pollutants from the crowd mainly depend on transportation. Emerging compression levels are generally significantly lower in those areas. The city spans, the air contamination such warming settings and lighting off, region and private vehicular transport, or assembly activities as human hobby, is related to the set. City pollution accordingly human passion, the topography, and the innate micrometeorology, spatial varies as it is reasonable to anticipate.

The importance of this topic is so high that the Directive 96/62 / EC, establishes the principles that Frank is a public strategy and delineate or to circumvent the order, cut close to the ambient air quality targets in the European is manipulated by the commission on the human condition and nature of harmful consequences, Associate States assess ambient air quality in the region to inform and enhance the quality of air, while it is unsatisfactory. Air pollution is usually very reliable web is monitored by fixed stations. A monitoring station just a huge scope of pollution standard research tool can calculate work.

However, continuous monitoring stations repeatedly so as to measure the ambient background concentrations or possible hotspot locations are assigned and they normally are in addition to the countless kilometers. In addition, the purchase and maintenance of such a heavy price to limit the number of capacities, non-scalability of the system and manipulating the spatial resolution of the pollution map is emerging. In fact, a stable sensor capable of spatial coverage scope is manipulated, so it's a huge interest in a vast number of detectors for monitoring period should seize. These failures, we advocate a cost-effective and sustainable vehicular sensor networks win. If requested efficiently, a VSN can offer a wide spatial coverage, and saw a finer granularity of the characteristics. Rather than employing static sensors, detectors in cars or transport services sector can be installed on vehicles.

Sensors attached on advancing vehicles periodically monitor the air quality and send gathered data to a central storage system. Though, there is a trade-off for this gain in spatial coverage. Temporal coverage of detected data in a particular locale will be lower contrasted to static sensors readings as a characteristic will be measured in the alike locale only when the vehicle will cross once more that point. This lack of temporal coverage can be grasped by rising web nodes density and so climbing sensors on extra vehicles, or allocating sensors on area buses, so that environmental characteristics can be monitored unceasingly alongside their routes. One more setback that ought to not be underestimated concerns corrupted measurements inside sensor networks. Sensor nodes could sporadically produce incorrect measurements due to battery depletion, dust on sensors, tampering and supplementary causes. Amid the countless mathematical methods and algorithms in works, suitable instruments to pre-process such gathered data are Bayesian Networks.

In the subsequent serving we debate a little continuing air contamination monitoring periods bestowing a brief overview of the state of the fine art.

6. Ontological Approach

Urban air contamination association needs elevated modeling and data processing techniques. Manmade intellect provides countless methods and technologies that can resolve effectually disparate environmental problems. AI methods present gains above extra established numeric modeling ways, that need heavy computational resources and demand as input convoluted data, frequently not facilely available. It is extremely vital to make decisions in environmental protection association, so a multi-agent arrangement (MAS) way might be requested as a valid and robust solution. A multi-agent arrangement is a web of multimedia agents that interact to resolve setbacks that are beyond the individual capacities or vision of every single setback solver. An agent can be a physical or adjacent entity that can deed independently and has skills to accomplish its aims and tendencies. According to, the knowledge of intelligent agents and multi-agent arrangements provides the multimedia groundwork for the implementation of distributed environmental arrangements that can monitor and manipulation the environmental quality.

In our context, the vehicular sensor web can be modeled as a multi-agent system composed by a set of intelligent entities. Every single vehicle has a little running multimedia agents, that monitor and examine the progress of environmental data like air quality, and report to a supervisor agent if a little critical setback can occur. According to Chomsky theories, data, gathered by sensors installed on vehicles, have to be embodied in a proper method so that intelligent decision agents can articulate and reason on it. A method to formalize data is the meaning of a correct ontology, that permit us to delineate memos alongside meaning and lacking ambiguity. One of the extra public aims in growing ontologisms is allocating public understanding of the construction of data amid people or multimedia agents. The contact amid agents depends generally on the adoption of a conceptualization, that is, a proper representation of the reality of a specific situation, so oncologic pace is frank in our arrangement, in order to delineate a public vocabulary for researchers who demand to allocate data in this area, but additionally for knowledge-based plans delineating that queries and assertions are exchanged amid agents. The use of detecting mechanisms and wireless sensor webs is rising, so a rising volume of heterogeneous data, data formats, and measurement procedures is generated. The ontological ideal provides a method to manage the sensors and the convoying volume of generated data. It can additionally be utilized to validate sensor readings and to sort out defective sensor data as delineated in, in that the W3C Semantic Sensor Web Incubator cluster (SSNXG) described an OWL 2 ontology to delineate the skills and properties of sensors, the deed of detecting and the emerging observations.

In order to formalize air quality thoughts, an ontology could be utilized to construction air contamination area concepts. Because one of the most vital ontology features is its reusability, we believed to construction our vision area according to AIR POLLUTION Ontology. This ontology is dedicated to air contamination research and domination, and has been truly utilized in Air Pollution.

Urban air contamination structured data will be understandable and process able by agents whose aim is to monitor and mitigate contamination results across disparate kinds of applications. For instance, joining 3D city models, meteorological factors and air contamination data, it is probable to guesstimate the quality of air in a little city area. One more interesting request might be road traffic management. Employing the data endowed by environmental and road ontology, it should be probable to develop a little intelligent multimedia agent that can set a suggested maximum speed for a vehicle, or impact traffic lights in order to grasp the number of vehicles on the roads of a particular metropolis area. These actions may give to disperse meteorological pollutants therefore cutting their compression in constructing adjoined spans.

7. Building Of Ontology For Air Pollution Control

Creating ontology is not a trivial problem. It needs not merely skills in data technologies but additionally deep vision in the modeled domain. The procedure of vision arrangement progress is structured in a couple of models that have to be created. On the 'context' level of abstraction three models is suggested: Organizational ideal, Task ideal and Agent's model. The organizational ideal describes the association alongside the target to notice the setbacks and opportunities of vision management. The Task ideal embodies task that are gave inside the organization. A task is whatever that has to be gave by an agent. The agent ideal describes all agents – executors of tasks - their acts, competencies, skills, and limitations. Ontology progress methodologies aid crafting ontologies in assorted area oriented applications. Countless methodologies have been industrialized in order to formalize crafting Ontologies for manufacturing or supplementary applications. Even though ontology progress methodologies are not mature plenty, they can be helpful in growing ontology established vision arrangements.

8. Releated Work

J., Fenger, et. al. (1999) [1] In this paper, since 1950 the world population has more than doubled, and the global number of cars has increased by a factor of 10. In the same period the fraction of people living in urban areas has increased by a factor of 4. In year 2000 this will amount to nearly half of the world population. About 20 urban regions will each have populations above 10 million people. Seen over longer periods, pollution in major cities tends to increase during the built up phase, they pass through a maximum and are then again reduced, as abatement strategies are developed. In the industrialized western world urban air pollution is in some respects in the last stage with effectively reduced levels of sulphur dioxide and soot. In recent decades however, the increasing traffic has switched the attention to nitrogen oxides, organic compounds and small particles. In some cities photochemical air pollution is an important urban problem, but in the northern part of Europe it is a large-scale phenomenon, with ozone levels in urban streets being normally lower than in rural areas. Cities in Eastern Europe have been (and in many cases still are) heavily polluted. After the recent political upheaval, followed by a temporary recession and a subsequent introduction of new technologies, the situation appears to improve. However, the rising number of private cars is an emerging problem. In most developing countries the rapid urbanization has so far resulted in uncontrolled growth and deteriorating environment. Air pollution levels are here still rising on many fronts.

Noboru, Yamazoe, Go Sakai et. al. (2003) [2] In this paper, semiconductor gas sensors utilize porous polycrystalline resistors made of semiconducting oxides. The working principle involves the receptor function played by the surface of each oxide grain and the transducer function played by each grain boundary. In addition, the utility factor of the sensing body also takes part in determining the gas response. Therefore, the concepts of sensor design are determined by considering each of these three key factors. The requirements are selection of a base oxide with high mobility of conduction electrons and satisfactory stability (transducer function),

selection of a foreign receptor which enhances surface reactions or adsorption of target gas (receptor function), and fabrication of a highly porous, thin sensing body (utility factor). Recent progress in sensor design based on these factors is described.

Mihaela. Oprea et. al. (2005) [3] In this paper, air pollution control in urban regions is one of the main directions of research in the environmental sciences. For each region the pollution causes and pollution dispersion are different, depending on the industrial activity, on vehicles traffic, on domestic sources and so on, as well as on the geographical location, temperature of the air, speed and direction of the wind, and other weather factors. Several mathematical models are used for the description of the relationships between environmental protection and meteorological factors. An alternative approach to the mathematical models is a knowledge-based approach that integrates multiple sources of knowledge in a knowledge base. The paper describes a case study of knowledge modeling in an air pollution control decision support system that uses DIAGNOZA_MEDIU, a prototype expert system dedicated to air pollution analysis and control in urban regions. We have developed ontology, AIR_POLLUTION, for the application domain. Several AI techniques were used in the knowledge modelling process. An artificial neural network provides predictive knowledge to the facts base, and a part of the rules from the rule base are extracted by using inductive learning.

Michael, Blaschke, Thomas Tilleet. al. (2006) [4] In this paper, microelectromechanical-system (MEMS) metal-oxide gas sensors have reached a mature stage, which makes mass market applications in the automotive area possible. In contrast to the already established flap-control system, which controls the access of (combustion) gases from outside the vehicle to the car cabin, the system studied here detects odor events created within the car cabin. The events under study have been cigarette smoke, fast-food odor, manure, and bio effluents (flatulence). As the reference cannot be a "simple analytical measurement," a human test panel for assessing the hedonic impression on a scale from 0 to 5 is used as reference. The technical system is a MEMS metal-oxide-sensor array consisting of three different sensors. The data-evaluation approach used here is combining the human-sensory data and the MEMS sensor data. The task is performed by the combination of two independent algorithms, where one is related to the normalized conductance and the other to signal variance. Using a combined approach has the advantage that "false" events are suppressed. After the algorithm was successfully transferred onto a microcontroller, real-life data were recorded and classified. Several practical examples are given in this paper. The overall gas-sensor system reaches good accordance with the human-sensory impression, which is represented by air quality levels. This enables the design of a demand-controlled ventilation system.

H. K. Eminir, Hala Abdel-Galil et. al. (2006) [5] In this paper, the lack of environmental data is a common feature of many developing countries. This is fact in Egypt, where air quality is beginning to be systematically monitored in some places of the country. To overcome these problems, the need for accurate estimates of air quality levels becomes evermore important. To achieve such prediction tasks, the use of artificial neural network (ANN) is regarded as a cost effective technique superior to traditional statistical methods. In this paper, ANN trained with a back propagation algorithm is used to estimate the well known pollutants, from readily observable local meteorological data. The results indicate that the ANN model predicted air pollutant concentrations with good accuracy of approximately 96 %.

Uichin, Lee, Biao Zhou, et. al. (2006) [6] In this paper, vehicular sensor networks are emerging as a new network paradigm of primary relevance, especially for proactively gathering monitoring information in urban environments. Vehicles typically have no strict constraints on processing power and storage capabilities. They can sense events (e.g., imaging from streets), process sensed data (e.g., recognizing license plates), and route messages to other vehicles (e.g., diffusing relevant notification to drivers or police agents). In this novel and challenging mobile environment, sensors can generate a sheer amount of data, and traditional sensor network approaches for data reporting become unfeasible. This article proposes MobEyes, an efficient lightweight support for proactive urban monitoring based on the primary idea of exploiting vehicle mobility to opportunistically diffuse summaries about sensed data. The reported experimental/analytic results show that MobEyes can harvest summaries and build a low-cost distributed index with reasonable completeness, good scalability, and limited overhead

Jakob, Eriksson, Lewis Girod et. al. (2008) [7] In this paper investigates an application of mobile sensing: detecting and reporting the surface conditions of roads. We describe a system and associated algorithms to monitor this important civil infrastructure using a collection of sensor-equipped vehicles. This system, which we call the Pothole Patrol (P^2), uses the inherent mobility of the participating vehicles, opportunistically gathering data from vibration and GPS sensors, and processing the data to assess road surface conditions. We have deployed P2 on 7 taxis running in the Boston area. Using a simple machine-learning approach, we show that we are able to identify potholes and other severe road surface anomalies from accelerometer data. Via careful selection of training data and signal features, we have been able to build a detector that misidentifies good road segments as having potholes less than 0.2% of the time. We evaluate our system on data from thousands of kilometers of taxi drives, and show that it can successfully detect a number of real potholes in and around the Boston area. After clustering to further reduce spurious detections, manual inspection of reported potholes shows that over 90% contain road anomalies in need of repair.

Yajie, Ma, Mark Richards et. al. (2008) [8]In this paper, we present a distributed infrastructure based on wireless sensors network and Grid computing technology for air pollution monitoring and mining, which aims to develop low-cost and ubiquitous sensor networks to collect real-time, large scale and comprehensive environmental data from road traffic emissions for air pollution monitoring in urban environment. The main informatics challenges in respect to constructing the high-throughput sensor Grid are discussed in this paper. We present a two-layer network framework, a P2P e-Science Grid architecture, and the distributed data mining algorithm as the solutions to address the challenges. We simulated the system in TinyOS to examine the operation of each sensor as well as the networking performance. We also present the distributed data mining result to examine the effectiveness of the algorithm.

Giuseppe, Anastasi, Giuseppe Lo Re et. al. (2009) [9] In this paper, monitoring structural health of historical heritage buildings may be a daunting task for civil engineers due to the lack of a pre-existing model for the building stability, and to the presence of strict constraints on monitoring device deployment. This paper reports on the experience maturated during a project regarding the design and implementation of an innovative technological framework for monitoring critical structures in Sicily, Italy. The usage of wireless sensor networks allows for a pervasive observation over the sites of interest in order to minimize the potential damages that natural phenomena may cause to architectural or engineering works. Moreover, the system provides real-time feedback to the civil engineer that may promptly steer the functioning of the monitoring network, also remotely accessing sensed data via Web interfaces.

Giuseppe, Anastasi, OrazioFarruggiaet. al. (2009) [10] In this paper, this work reports the experience on the design and deployment of a WSN-based system for monitoring the productive cycle of high-quality wine in a Sicilian winery. Besides providing the means for pervasive monitoring of the cultivated area, the project described here is aimed to support the producer in ensuring the overall quality of their production, in terms of accurate planning of interventions in the field, and preservation of the stored product. Wireless Sensor Networks are employed as the sensing infrastructure of a distributed system for the control of a prototypal productive chain; nodes have been deployed both in the field and in the cellar, where wine aging is performed, and data is collected at a central unit in order to perform inferences that suggest timely interventions that preserve the grapes' quality.

Artis, Mednis, Girts Strazdinset. al. (2010) [11] In this paper, Road surface analysis including pothole reports is an important problem for road maintainers and drivers. In this paper we propose a methodology for pothole detection using mobile vehicles equipped with off the shelf microphone and global positioning devices attached to an on-board computer. The approach is generic enough to be extended for other kind of event detection using different sensors as well. The vehicles are driving on public streets and measuring pothole induced sound signals. Our approach was tested and evaluated by real world experiments in a road segment for which we had established the ground truth beforehand. The results show pothole detection with high accuracy despite the background noise and other audio events.

A. R., Al-Ali, Imran Zualkernan et. al. (2010) [12] In this paper, an online GPRS-Sensors Array for air pollution

monitoring has been designed, implemented, and tested. The proposed system consists of a Mobile Data-Acquisition Unit (Mobile-DAQ) and a fixed Internet-Enabled Pollution Monitoring Server (Pollution-Server). The Mobile-DAQ unit integrates a single-chip microcontroller, air pollution sensors array, a General Packet Radio Service Modem (GPRS-Modem), and a Global Positioning System Module (GPS-Module). The Pollution-Server is a high-end personal computer application server with Internet connectivity. The Mobile-DAQ unit gathers air pollutants levels (CO, NO2, and SO2), and packs them in a frame with the GPS physical location, time, and date. The frame is subsequently uploaded to the GPRS-Modem and transmitted to the Pollution-Server via the public mobile network. A database server is attached to the Pollution-Server for storing the pollutants level for further usage by various clients such as environment protection agencies, vehicles registration authorities, and tourist and insurance companies. The Pollution-Server is interfaced to Google Maps to display real-time pollutants levels and locations in large metropolitan areas. The system was successfully tested in the city of Sharjah, UAE. The system reports real-time pollutants level and their location on a 24-h/7-day basis.

Alessandra, De Paola et. al. (2011) [13] In this paper, common sensory devices for measuring environmental data are typically heterogeneous, and present strict energy constraints; moreover, they are likely affected by noise, and their behavior may vary across time. Bayesian Networks constitute a suitable tool for pre-processing such data before performing more refined artificial reasoning; the approach proposed here aims at obtaining the best trade-off between performance and cost, by adapting the operating mode of the underlying sensory devices. Moreover, self-configuration of the nodes providing the evidence to the Bayesian network is carried out by means of an on-line multi-objective optimization.

S.C., Hu, Y.C. Wang, Huang et. al. (2011) [14] In this paper, considers a micro-climate monitoring scenario, which usually requires deploying a large number of sensor nodes to capture environmental information. By exploiting vehicular sensor networks (VSNs), it is possible to equip fewer nodes on cars to achieve fine-grained monitoring. Specifically, when a car is moving, it could conduct measurements at different locations, thus collecting lots of sensing data. To achieve this goal, this paper proposes a VSN architecture to collect and measure air quality for micro-climate monitoring in city areas, where nodes' mobility may be uncontrollable (such as taxis). In the proposed VSN architecture, we address two network-related issues:

(1) how to adaptively adjust the reporting rates of mobile nodes to satisfy a target monitoring quality with less communication overhead and
(2) how to exploit opportunistic communications to reduce message transmissions. We propose algorithms to solve these two issues and verify their performances by simulations.

In addition, we also develop a ZigBee-based prototype to monitor the concentration of carbon dioxide (CO2) gas in city areas.

Alessandra, De Paola, Salvatore Gaglio et. al. (2012) [15] In this paper, ambient Intelligence systems are typically characterized by the use of pervasive equipment for monitoring and modifying the environment according to users' needs, and to globally defined constraints. Our work describes the implementation of a testbed providing the hardware and software tools for the development and management of AmI applications based on wireless sensor and actuator networks, whose main goal is energy saving for global sustainability. A sample application is presented that addresses temperature control in a work environment, through a multi-objective fuzzy controller taking into account users' preferences and energy consumption.

Srinivas, Devarakonda, ParveenSevusu et. al. (2013) [16] In this paper, traditionally, pollution measurements are performed using expensive equipment at fixed locations or dedicated mobile equipment laboratories. This is a coarse-grained and expensive approach where the pollution measurements are few and far in-between. In this paper, we present a vehicular-based mobile approach for measuring fine-grained air quality in real-time. We propose two cost effective data farming models -- one that can be deployed on public transportation and the second a personal sensing device. We present preliminary prototypes and discuss implementation challenges and early experiments.

9. Conclusion & Future Work

Air contamination manipulation in city spans is one of the main orders of research in the environmental sciences. For every single span the contamination reasons and contamination dispersion are disparate, reliant on the manufacturing attention, on vehicles traffic, on internal origins and so on, as well as on the geographical locale, temperature of the air, speed and association of the wind, and supplementary meteorological conditions factors. Countless mathematical models are utilized for the description of the connections amid environmental protection and meteorological factors. An alternative way to the mathematical models is a knowledge-based way, that incorporate several origins of vision in a vision base. The paper describes a case discover of vision modeling in an air contamination employing ontologies. In upcoming we will endeavor to use regression models and ontology for city air contamination estimation.

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