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EDGE INTELLIGENCE FOR SMART CITY DECISION

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ABSTRACT

The concept of "smart cities" is an innovative one for the urban landscapes of the future. The use of cutting-edge technology with the goal of optimising municipal resources and operations while simultaneously improving the quality of life for citizens is the ultimate objective of the so-called "smart city" movement. It will be important to make advantage of contemporary breakthroughs in information and communication technology, data analysis, and other fields of technology in order to fulfil this ambitious objective. Because smart cities generate naturally enormous amounts of data, recent artificial intelligence (AI) approaches are interesting because of their capacity to transform raw data into meaningful information that can be used to guide decision making. This is important because smart cities are becoming increasingly common (e.g., using live road traffic data to control traffic lights based on current traffic conditions). However, training and providing these artificial intelligence applications is not an easy operation and will need a significant amount of computer resources to accomplish. One kind of sensing device that is utilised often in a variety of applications that are now being developed for the Internet of Things is composed of cameras that are scattered across public

locations in order to capture the actions that take place in the monitored regions. This type of device has led to the development of a specialised subset of the Internet of Things that is known as the Internet of Multimedia Things (IoMT) which is also known as the Multimedia Internet of Things (M-IoT) or the Internet of Media Things (IoMT), as proposed in the recent ISO/IEC 23093-1:20202 standard. This subset of the Internet of Things was brought about by the widespread use of devices like these.

KEYWORDS: Intelligence, Smart City, Internet of Media Things, Multimedia Internet.

INTRODUCTION

The concept of "smart cities" is an innovative one for the urban landscapes of the future. The use of cutting-edge technology with the goal of optimising municipal resources and operations while simultaneously improving the quality of life for citizens is the ultimate objective of the so-called "smart city" movement. It will be important to make advantage of contemporary breakthroughs in information and communication technology, data analysis, and other fields of technology in order to fulfil this ambitious objective. Because smart cities generate naturally enormous amounts of data, recent artificial intelligence (AI) approaches are interesting because of their capacity to transform raw data into meaningful information that can be used to guide decision making. This is important because smart cities are becoming increasingly common (e.g., using live road traffic data to control traffic lights based on current traffic conditions). However, training and providing these artificial intelligence applications is not an easy operation and will need a significant amount of computer resources to accomplish. Cloud computing infrastructure was traditionally used to process computationally intensive tasks; however, due to the time-sensitive nature of many of these smart city applications, novel computing hardware and technologies are required. Cloud computing infrastructure is still used to process computationally intensive tasks. The architecture of cloud computing has typically been utilised to handle activities that need a significant amount of processing. The relatively recent development of edge computing provides the promise of a computer infrastructure that will be able to manage the needs of smart cities in the future. Smart cities are cities that are equipped to handle the demands of advanced technology. Computing at the edge provides computational resources in close proximity to end users, which reduces latency and improves the capacity to scale. As a consequence of this, edge computing is an excellent candidate for

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providing assistance for smart cities. However, there are hardware requirements that must be satisfied before utilising it, and they must be taken into mind.

COMPLETELY SATISFIES ALL OF THE REQUIREMENTS TO BE CLASSIFIED AS A SMART CITY

It is possible to conceptualise and define the term "smart city" in an almost endless number of different ways. What exactly defines a "smart city" is up for debate. A smart city is a high-tech metropolis that connects people, information, and the infrastructure and resources of the whole city by using advancements in technology to increase sustainability, innovation, and the general quality of life of its residents. A further definition, offered by smart cities, describes them as being high-tech cities whose primary purpose is to link people, information, and the resources and infrastructure of the whole city.

a difficult subject that has been debated in the research that is pertinent to the topic at hand. However, the many different visions for what defines smart cities all generally involve heavy use of technology to improve the maintenance of cities to further improve and/or optimise city-specific operations for various stakeholders. This is true despite the fact that there are many different visions for what defines smart cities. This is true irrespective of the particular vision that is being contemplated (e.g., citizens, the environment). It is necessary to make judgements for a wide variety of applications and domains in a seamless manner, while sacrificing as little as possible in terms of performance and the prices of resources in order to make the lofty vision of smart cities a reality. This is one of the challenges that must be overcome in order to make this vision a reality. Applications that are of interest for smart cities include, but are not limited to, smart traffic light control, smart information dissemination (or advertising), smart energy distribution, smart waste management, etc.; however, these are not the only applications of interest for smart cities.

Since the Internet of Things (IoT) was first introduced in the early 2000s the Internet has developed into the primary infrastructure for the distribution of all forms of information, ranging from simple text to intricate multimedia streams, and being produced by both physical and virtual entities. This infrastructure has allowed the Internet to become the primary infrastructure for the distribution of all forms of information. Simultaneously, the number of "things" (items that are endowed with sensors and actuators) that are connected to the internet has significantly expanded, which has driven the development of a wide variety of applications. "Things" may be defined as objects that are equipped with sensors and actuators. The lives of

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modern humans include an ever-increasing variety of electronic devices, each of which is capable of acquiring data from its surroundings and carrying out computing operations. Smartphones and smartwatches are the most common kinds of gadgets that are capable of processing the personal sensing data and giving their users with information that is helpful to them.

One kind of sensing device that is utilised often in a variety of applications that are now being developed for the Internet of Things is composed of cameras that are scattered across public locations in order to capture the actions that take place in the monitored regions. This type of device has led to the development of a specialised subset of the Internet of Things that is known as the Internet of Multimedia Things (IoMT) [2], which is also known as the Multimedia Internet of Things (M-IoT) or the Internet of Media Things (IoMT), as proposed in the recent ISO/IEC 23093-1:20202 standard. This subset of the Internet of Things was brought about by the widespread use of devices like these.

Due to the high demand to handle and store such huge amounts of data, the standard ISS consists of a series of cameras that communicate their created streams to video analytic software that is operating on powerful infrastructures (such as data centres). In the context of a smart city, locating criminal suspects or people who have gone missing is an example of an application that may be run on an ISS and is used by law enforcement organisations. The use of face recognition technology to the video feeds captured by the city's cameras makes it possible to identify persons of interest in public areas. However, the value of this event of identifying a particular individual is contingent on the fact that the location of such a person is promptly notified to the authorities who are authorised to do so. If this does not occur, the information that was created may be rendered meaningless since the individual will no longer be in the area that was reported. This characteristic alludes to the fact that the processing of these data for the generation of relevant events is dependent on the speed of this processing and suggests that the volatility of the data in IoT points to the fact that these data are volatile. For the sake of this discussion, Forrester Research, Inc. developed the phrase "perishable insights" to refer to pieces of knowledge that need to be used as soon as possible or risk losing their value. It is possible to assert that the knowledge generated by Internet of Things devices in a variety of application domains is ephemeral, and it is recommended that events (and the reactions taken from them) be identified, preferably over data in motion, as close to the time that they take place as is practically possible.

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EDGE INTELLIGENCE

The Internet of things (IoT) is home to a wide variety of applications, each of which has its own unique set of challenges for edge computing, which must contend with a wide variety of devices, services, and protocols. Edge computing, which is driven by artificial intelligence (AI), provides an efficient way to meet this difficulty, which results in new advancements in AI, gadgets, and edge computing. Edge computing is also known as edge computing. In recent years, there has been a lot of talk about edge intelligence, and many people think it will be essential to the success of the future Internet of Things (FIoT). In addition, edge intelligence enables Internet of Things devices to analyse data by using AI and machine learning methods, which in turn drives further development of intelligent Internet of Things applications. Edge intelligence has significant promise in a variety of Internet of Things applications, such as smart homes, intelligent transportation systems, electronic healthcare, wearable gadgets, and many more. With edge intelligence, the Internet of Things will enable IoT devices to process data locally, which will reduce the amount of data transmitted over IoT systems. This will mitigate the workload from the existing data centres to the edge, and only the data that is necessary will need to be shared or exchanged. This may also lessen the dangers that data poses on the internet of things. In this issue, we describe four important applications of edge intelligence enabled Internet of Things solutions: smart metres interior navigation utilising IoT devices.

In spite of the fact that edge computing and blockchain have been the subject of a significant amount of research, relatively few publications examine the use of edge artificial intelligence and blockchain in smart cities. The purpose of this article is to provide an overview of current research efforts on edge artificial intelligence and blockchain for the purpose of allowing intelligent and secure edge applications and networks in two essential domains of smart cities, namely smart mobility and smart energy. Following a brief introduction to both edge AI and blockchain, we will then discuss the research efforts that have been made to integrate these two developing technologies. Some of the topics that will be covered include the training of learning models at the edge; security; privacy; scalability; and model sharing. Primarily, we present a survey on the use of AI at the edge in a variety of applications in smart mobility, such as the monitoring and management of traffic in intelligent transport systems, and smart energy, such as the optimization of energy management in smart buildings, green energy management, and energy efficiency in smart cities. In addition, we examine recent research efforts that have been made on the use of Blockchain in a variety of applications in smart mobility, such as distributed credential management, reputation systems, key and trust management, and smart

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energy, which includes distributed energy management and energy trading. In addition, a discussion of potential research obstacles and future approaches is included. The following is a list of the most important contributions that this article makes:

1. It offers an introduction to the principles of blockchain technology and edge AI.
2. It investigates the possibilities presented by AI at the edge in the fields of smart transportation and smart energy.
3. It investigates the possibilities presented by Blockchain technology in the areas of intelligent transportation and intelligent energy.
4. It discusses some of the attempts that have been made to combine these two developing technologies within the framework of smart cities.
5. Finally, it describes significant outstanding research concerns and future approaches for the complete implementation of edge AI and Blockchain in smart cities.

SMART CITY SYSTEMS AND KEY CHALLENGES

As a result of the increase in the global population, both small and major cities are experiencing enormous waves of migration, which puts pressure on local governments and authorities to address a wide range of socioeconomic problems. These issues essentially concern ensuring a consistent supply of water and electricity, providing adequate healthcare services for all citizens, building and maintaining road infrastructure, providing adequate public transportation, ensuring security and safety throughout the city, and offering adequate education services These issues also concern ensuring adequate public transportation.

The future of cities appears to be bright as an increasing number of local governments are beginning to build on smart city initiatives and embrace new digital technologies and innovations in order to address all of these issues, maximise the use of resources, provide a higher quality of life for residents, and create a more favourable investment climate for businesses Many chances for innovation, including the development of new services and the provision of intelligent solutions for cities, are presented to businesses via smart city projects. Entrepreneurs are given the ability to build new intelligent solutions and new business models as a result of the large volumes of data acquired by smart city technologies and the breakthroughs made in data stream processing, machine learning, and artificial intelligence.

Other cities are being enticed to join the smart city movement by the likes of Dubai, Barcelona, Amsterdam, Singapore, New York, and Stockholm, to name only a few The concept of a smart

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city refers to a complex entity that integrates a variety of different technologies to support the human life cycle. Among these systems are those for intelligent healthcare,

Intelligent Medical Care The term "smart healthcare" refers to a collection of technologies that are utilised to actively manage patient health data and intelligently respond to the requirements of the medical ecosystem. The goals of smart healthcare are to extend people's lifespans and enhance the overall quality of their lives. These technologies offer dynamic access to information, linking people, resources, and health-related organisations. Examples of these technologies include mobile devices, devices connected to the Internet of Things (IoT), and mobile Internet. Smart healthcare aims to promote interaction between all entities involved in health care, such as hospitals, pharmacies, and healthcare insurers, to assist these entities in making informed decisions, to guarantee that participants have access to the services they require, and to make it easier to rationally allocate resources.

THE FUTURE OF INTELLIGENT TRANSPORTATION

Smart cities are entering a new age of a development that is referred to as smart transportation as a result of the spread of solutions based on the Internet of Things (IoT), the development of artificial intelligence, and the advent of intelligent transportation systems. Smart city traffic management and smart transportation are transforming the way cities approach mobility and emergency response while simultaneously alleviating traffic issues by lowering congestion and the number of accidents on the streets and highways of cities The implementation and use of sensors, modern communication technologies, high-speed networks, and automation are essential to the success of smart transportation.

SMART MANUFACTURING

The monitoring of the manufacturing process via the use of equipment that are linked to the Internet is an example of smart manufacturing, which is a strategy that is driven by technology. Its primary objective is to provide options for automating activities by using data analytics in order to improve manufacturing and energy efficiency, promote worker security, and lower environmental pollution levels.

Integration of Internet of Things (IoT) devices into industrial equipment for the purpose of gathering information on the machinery's operational state and performance is required for smart manufacturing deployments. In addition, several technological advancements, such as the processing of data streams, edge and fog computing, artificial intelligence, robots,

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driverless cars, blockchain, and digital twins, are being used to assist in the implementation of smart manufacturing.

RESEARCH METHODOLOGY

This chapter gives a definition of the modern-day country of studies related to cp-net at the time it was written. Because much of that study applies the boundaries of formalism, section 3.1 provides a summary of the rules that can be applied to fashion. These include restricting the size of the community, the amount of domain names, and other similar factors. The task of finding the most appropriate effects given cp-net is one of the topics covered in section 3.2, as well as the mission of finding optimal outcomes. we take a look at the assignment of determining whether cp-internet is stable. The problems with the logic of using cp-net are mentioned in section 3.4. These include assessment of dominance, ordering of questions, and heuristic procedures. In addition, the problem of reasoning issues is contained in this stage. In section 3.5, the problem or related question of obtaining knowledge of cp-net from result contrast data is discussed, as well as what is known about each subject matter problem.

CP-NET MODELS IN THEIR STANDARD AND RESTRICTED FORMS

This is the case despite the fact that cp-net is recognized to have cycles in dependency graphs. Furthermore, features of the final result space, provided that they can be discrete, are capable of having more than one value, and cpts are capable of having at most one effective partial specification (that is, incomplete), And cprs are able to represent a sloppy overall order over the whole field of nearby variables. It may be impossible to reason with such a broad fashion, and there is no guarantee that the resulting sequence may be stable over the results. Never mind the fact that such general models may additionally reflect a much wider variety of situations, they may also be intractable.

Different limits, either on the cardinality of the largest field together or on the amount of cardinality when the domain names are odd, can also be placed on variable domain names. One constraint that is quite common is that every variable has to be binary. Every other regular problem is that cpts want to be complete, meaning that every cpt wants to be fully defined with a linear sequence on the local variables for each challenge to its parent. Cp-nets that can be built by acquiring knowledge of algorithms are an interesting exception on the account that it is well-known learning to supply cp-nets for algorithms that may be likely to be incomplete Remaining but not least, most studies do not allow for indifference, focusing instead on cp-nets, which may only be capable of modeling firm solutions.

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FINDING THE INFLUENCERS THAT MAY BE MOST FAVORABLE

When dealing with probabilities, one of the most common demanding situations is figuring out which result (or in some situations, an end result) the concern most desires. For example, It is pretty common knowledge that problems of this nature involving optimization of various compact formalisms are difficult. Although

Table .1 : characterization by cp-net dependency graph

Dependency graph	Resultant class of cp-net	Reference
Chain	Chain cp-net	[16]
Antichain	Detachable cp-net (scp-net)	[66]

Boutilier et al. [2016] showed that it is straightforward to fix the project of optimizing results in cyclic, fully connected cp-nets. In such situations, the exceptionally proper result is of course one-of-a-kind and can be located in linear time depending on the range of nodes for which they are a sweep, using a set of rules referred to as forward sweeps. Provide explanation.

The related problem of finding fine-tuned effects in acyclic cp-internets (perhaps with the whole of cpt) can be computed in polynomial time within the number of variables, as long as it is assumed that the answers are determined in a specific way. Can be linearized from , joe brafman et al. [2020] talk as a contextual term for linearization. It was proved that the problem can be solved in polynomial time in a limit of variables. In the case when cpts are missing, on the other hand, the difficulty of determining the maximally preferred and nice-to-have outcomes appears to be an open task.

VERIFYING THAT EVERYTHING IS NORMAL

In some cases, as discussed in step 2.4, cp-net has the ability to impose an intransitive order on the results. For example, as referenced in step 2.4, inconsistencies can arise if a cycle occurs in the dependency network (see determine 2.5). have proven that continuity can be successfully tested for a large class of cyclic, binary cp-nets through the use of their algorithm. Pspace-completeness was later proved by goldsmith and colleagues, but the general problem still remains. In more recent cases, have simplified the problem by reducing it to between version testing using the kreisner cp-net reasoning device.

FOUR IMPORTANT DIRECTION NETWORK REASONING

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The object of the reasoning problem is to decide which of the particular possibilities is supported, assuming that any one of them is honestly optimal. In section 3.4.1, we talk about dominance checking, which is the most robust line of reasoning. Next, section 3.4.2 discusses less reliable techniques of administering the interrogation. Heuristic techniques are discussed in the last part of this chapter (step 3.4.3).

ANALYZING WHOSE HAND IS UP

Recall from section 2.4 that the dominance test (dt) determines whether a cp-net n is given from oj to o with strict choice and 2 outcomes o and oj. This is finished by finding whether there is a dominant flipping chain from oj to o. If so, the cp-internet is known to suggest that the primary end result dominates the other, denoted by n |= o > oj.

-is complete. , in some situations, notably chain cp-nets, the flipping length can be as short as (2n/2), this being an exponential in the number of nodes. There are many subclasses of dt that can be solved easily. This was achieved by reversing the order of the nodes in the tree. They claim that even when the cpt disappears, the technique remains complete, preserving its earlier level of temporal complexity.

Therefore, at the same time that the solution to the selection difficulty can be located in linear time, the computation of the flipping series takes quadratic time.

Table 1: **computational difficulty of dominance test**

Graph	Domain	Cpt	Dt complexity	Running time	Reference
Guided forest	Binary	Complete	P	But)	[1 1]
Guided forest	Binary	,	P	$O(n^2)$	[16]

This is the case whether the variables are binary or not (and np-hard otherwise). The problem continues to be considered np-complete even though the maximum number of paths between any two nodes inside the network can be restricted by means of a polynomial (this is in maximally-linked graphs). The computational complexity of several dt algorithms for unique training of cp-net and the invariant examples are broken down and summarized in table 3.2.

Both the field of arithmetic and the field of pc technology have researched the random arrival of mixed objects including trees and paths in directed graphs. Random generation of integers has also been researched. But, similarly complex preference fashioning strategies such as cp-net have not attracted interest so far due to the loss of progress in this area.

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Real-world facts are difficult to obtain consistently, extremely difficult to analyze, and obscure from time to time. They are also not easily available. Real-world data does not exist for cp-net. It is very feasible to produce simulated facts in social preference and preference processing with the help of the use of generative cultures, and there are theoretical methods for doing so. Even though such cultures have their own drawbacks and limitations, they provide a preliminary step to experimentally approach domains in which data are very difficult to obtain. In social choice, preferences for more complex structures such as cp-nets are no longer uniform, despite the fact that there may be clear distinctions between preferences for generative cultures on a strict linear order. So one can generalize to statistical cultures that are employed in social preference, we need the ability to supply samples from a particular set of cp-nets that are uniformly random.

In this chapter, we can talk about how to build an acyclic cp-net in a uniform and random manner. We can discuss a way to increase the partial dagcodes, as well as a way to enumerate all such dagcodes, since these tuples are already in the form of cp-nets, or variations of potential graphs and conditional desire tables (cpts). Are known. Due to the innovative iteration that arises from this method, it is now possible to construct graphs and cpts, one node at a time, in such a way that all cp-nets are fixed over the length and degree of a particular region. Likely so. Sections 4.1 and 4.2 discuss the problems that arise as an immediate consequence of the massive implementation of intuitive technology techniques: bias and degeneracy. In section 4.2, you can explore ways to encode cpts, even to remove the distortion of their use. The encoding of the dependency graphs as well as their counting is covered in step 4.3. Next, the findings are compiled in step four. Four, in which they are used to develop a set of rules for peacefully sampling the occupied space using cp-net. In section 4.5, we have a look at how to do advisory sampling from the dominance group testing problem events and outcomes. Additionally, the subject of notation is bled into with spectacular rapidity in chapter 2; see primarily desk 4.2.

NATIVE TECHNOLOGY, BIAS AND DEGRADATION

There are a number of unique reliable randomization methods that can be used if one needs to generate a cp-net without being concerned about the distribution. For example, create a cp-internet with n nodes, however not connected to any edge, and leave cpt empty; choose a random subset of pairs (xh, xi) such that h comes before i and each contains a region from xh to xi. Then, for each xi, d|pa(xi)| construct a cpt with policies, where each rule is a random

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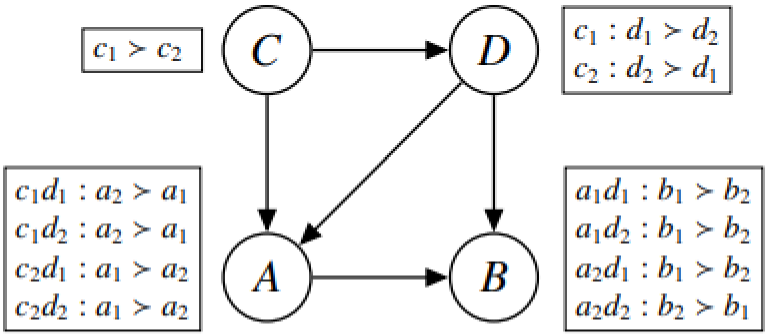
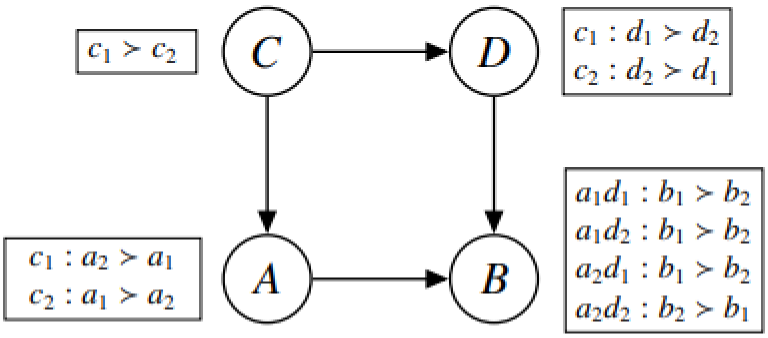
permutation of d values of xi. Finally, randomly permute the n labels. When studying a file that says, "we produced one thousand cp-nets at random," one suspects whatever the author is referring to along those lines. Alternatively, this fiddle i prefer to refer to the encoding as dagcode rather than dag code (as in), so that it's mi clear if i'm talking about encoding or dag.



Degenerate cp-net



Equivalent non-degenerate cp-net

Fig. 1: an example of distortion in cp-net

Example 17. Check the cp-internet proved in discussion.1. However, if one looks in excellent detail at one's cpt, they can see that the choice for a does not actually depend on d. It is something that can be seen. As a result, alternatives can be represented by a more realistic cp-internet than that displayed in parent 4.1b.

The reasons why degeneracy occurs in synthetic datasets are complex. First, in example 17 the dependencies inside the graph with threshold (d, a) may be imaginary. Second, if degeneracy is feasible, some cp-internet models that appear to be quite different from each other although similar may map to the induced volition sequence.

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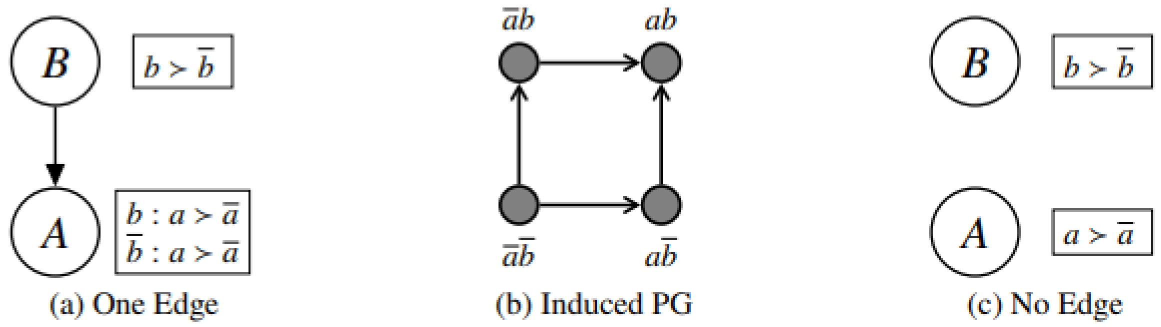

Figure .2 : **fallacy may violate basic assumptions of an experiment**

Example 18. Are we a researcher interested in determining how the amount of time required to execute a dt set of rules changes in response to an increase within a wide variety of edges in a network. (he also believes that a well-designed bar chart will make a positive impression on reviewers.) Within the first step of the process, he uses a simple technique to construct two separate units of cp-net. Is. Each set has a cp-net which can be composed of a binary domain name and two nodes; but, the first set contains only one edge, while the second set does not contain any edge. However, if each cpr is chosen by tossing a coin, we can also predict that fifty percent of the cp-net in the first set may be degenerate, which is just proved in 2a. Because of this, the induced choice graph for it, which may appear in fig. .2b, may be similar to the graph for the no-face cp-net, which may appear in fig. 2c. As a result, one of the fundamental assumptions of the test, which had been that the 2 sets would produce an amazing ranking order, was proved wrong.

CONCLUSION

In this paper, we discussed the difficulty of obtaining knowledge of cp-net using neighbourhoods, exploring the use of preference records that can be noisy and inconsistent. This encoding was used extensively to demonstrate one way of using it. It is feasible to apply this encoding to find nodes in a cp-net set up like a tree. In evaluating cp-net in general, for which it is assumed that checking dominance is np-hard, such models can also test their dominance in polynomial time at best once they are efficient. Because of this, tree-generated cp-net models are of interest due to the fact that dominance testing can be accomplished with them in polynomial time. We provided a framework of the proximity search set of rules that was encouraged through walk-sat and which is capable of improving and stabilizing the understanding of random search. Stroll-sat is a search algorithm that aims to find answers to optimization problems using a search strategy called greedy optimization. According to the

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findings of the experiments, it would appear that the approach is particularly capable regardless of the presence of noise.

REFERENCES

1. T. E. Allen. CP-nets with indifference. In Communication, Control, and Comput- ing (Allerton), 2013 51st Annual Allerton Conference on, pages 1488–1495. IEEE, 2013.
2. T. E. Allen, J. Goldsmith, and N. Mattei. Counting, ranking, and randomly generat- ing CP-nets. In MPREF 2014 (AAAI-14 Workshop), 2014.
3. T. E. Allen, M. Chen, J. Goldsmith, N. Mattei, A. Popova, M. Regenwetter, F. Rossi, andC. Zwilling. Beyond theory and data in preference modeling: Bringing humans into the loop. In Proceedings of the Fourth International Conference on Algorithmic Decision Theory (ADT), 2015.
4. Thomas E Allen. I prefer to eat. In Workshops at the Twenty-Ninth AAAI Confer- ence on Artificial Intelligence, 2015.
5. Thomas E Allen, Judy Goldsmith, Hayden E Justice, Nicholas Mattei, and Kayla Raines. Generating cp-nets uniformly at random. In Proceedings of the 30th AAAI Conference on Artificial Intelligence (AAAI), 2016.
6. Fani Athienitou and Yannis Dimopoulos. Learning CP-networks: a preliminary investigation. Procedings 3rd Multidisciplinary Work. on Advances in Preference Handling (PREF’07), 2007.
7. Reyhan Aydog˘an, Tim Baarslag, Koen V Hindriks, Catholijn M Jonker, and Pınar Yolum. Heuristic-based approaches for CP-nets in negotiation. In Complex Auto- mated Negotiations: Theories, Models, and Software Competitions, pages 113–123. Springer, 2013.
8. Fahiem Bacchus and Adam Grove. Graphical models for preference and utility. In Proceedings of the Eleventh conference on Uncertainty in artificial intelligence, pages 3–10. Morgan Kaufmann Publishers Inc., 1995.
9. Jose´ L Balca´zar, Antoni Lozano, and Jacobo Tora´n. The complexity of algorithmic problems on succinct instances. In Computer Science, pages 351–377. Springer, 1992.
10. Sven Berg. Paradox of voting under an urn model: The effect of homogeneity. Public Choice, 47(2):377–387, 1985.

Upendra Kumar *, *University Department of COMPUTER SCIENCE, B.R.A. Bihar University, Muzaffarpur, India. E-mail: upeendra@gmail.com.*

11. D. Bigot, H. Fargier, J. Mengin, and B. Zanuttini. Probabilistic conditional prefer- ence networks. In Proceedings 29th Conference on Uncertainty in Artificial Intelli- gence (UAI), 2013.

Upendra Kumar *, *University Department of COMPUTER SCIENCE, B.R.A. Bihar University, Muzaffarpur, India. E-mail: upeendra@gmail.com.*