used to "slice" virtual networks in order to meet varying service requirements and user expectations for QoE. We also discuss an approach that considers the integration of 5G and Weightless-N (TVWS) technologies intending to decrease interference at the cell's periphery [21]. The importance of ubiquitous connectivity, enabled by technologies like 5G and LPWAN-IoT, is discussed. In addition, we outline the paths that future research should take, such as developing a unified 5G network and LPWAN-IoT architecture that can allow integration with developing technologies and endogenous security for enhanced/secured smart city and remote area IoT applications. Finally, this article proposes combining LPWAN and LEO satellites to provide constant connectivity to the Internet of Things.

2.1. Urban Public Space

Despite its arcane tone, "interaction" is not solely a technical word. At first, "interaction" meant how two or more individuals regularly engage with one another. Since its introduction, its applicability has expanded to cover phenomena that may interact in more than one manner. The term "interaction" connotes the exchange of information between two people, making it easy to grasp the interaction design concept in public urban settings [22]. The discipline of interaction planning has just begun to develop to its full potential. Interface design, on the other hand, has its roots in the convergence of fields like industrial design. Because of their interdisciplinary character, terms like "technology," "visual design," "human-computer interface," "human factors," and "user experience design" are often imprecise. At the very least, people can now provide hard evidence that the event occurs between material things [23].

Consequently, there is continual communication and information exchange between individuals. The interface designer's goal should be to facilitate interactions in which both parties benefit. Additionally, interface design encompasses three design methodologies: a theory based on technology, behavior, and social interaction. Interface designers, according to the proponents of the technology-centric approach, depend heavily on a wide range of technologies, particularly digital ones, to build accessible and useful products [24]. Some have hypothesized that the principles of behavior-centrism, which hold that interface design are a behavior that dictates the environment, objects, and systems, are responsible for this explosive growth. Many people believe that socializing is essential. For him, the ultimate goal of his work in interactive design is to help people get closer to each other [25].

In today's high-stress environment, it is nice to be able to unwind and unload. The users of an interactive screen are treated as a dynamic component in the design process. The more curious a visitor is about the subject matter of an exhibit's game, the more likely they are to participate. Data created through various forms of interactive recreation may affect one another due to the transient character of the human population, which is the foundation for interactive communication [26]. With its help, visitors may be welcomed into a more engaging and intriguing neighborhood. High-quality interactive screen design projects engage the audience and make them experience strong emotions, both positive and negative. A large part of what makes a design project successful is the amount of joy, excitement, and satisfaction it brings to its target demographic [27]. New technologies are primarily responsible for the recent uptick in the public display of creative expression. Modern architecture has significantly influenced the aesthetic quality of urban public areas. The spectator may get a fresh perspective due to the designer's obvious talent and boundless imagination [28]. The internal display has experienced several modifications in strategy, methodology, and appearance to meet the requirements of modern technological, aesthetic, and built-environment standards [29]. Dynamic and interactive visuals are discussed with digital media, photo-acoustic and electrical auxiliary displays, audience interaction, and system control. Create a network of related people and things. This is a significant advancement compared to earlier generations of screen technology [30]. The use of projection to emphasize contrast has resulted in a more logical and scientific end product, all due to state-of-the-art technology. An effective interactive display will engage the visitor's intellect and body. If you want your visitors to leave your exhibit having learned something new and having had a great time, you need to give some attention to the service design that comes after they interact with your exhibit [31].

Conventional urban landscape design and planning methods cannot effectively, clearly, and coordinatedly explain the planning consequences of many systems and enormous scenes. Moreover, these methods cannot include thoughts in the whole planning process for scenes. As a result of the development of Wireless Sensor Networks (WSNs) and 5G technologies, the usage of Virtual Reality (VR) has become an essential component in a variety of facets of the process of building and planning urban landscapes.

Contribution

- By summarising and assessing earlier works, this article examines the current state and significance of "Three-Dimensional (3D)" depictions of urban landscape design and planning.
- Developing virtual scene modification tools, a roaming algorithm, and a 3D database. Together with the 3D model, the CapsNet (Capsule Network) neural model is used to train data and enhance outcomes by emphasizing the interactive area in the urban landscape.
- CapsNet improves VR and AR computer vision tasks. A 3D visual system using the CapsNet architecture may instantly communicate enormous amounts of data via images, allowing specialists to detect testing results or interactively handle them easily.
- By using smart sketching, comprehensive presentation, and fast reporting, VR offers designers realistic data processing benefits, dramatically enhancing design productivity and successfully enabling design quality.

This article discusses the current condition and importance of "Three-Dimensional (3D)" portrayed urban landscape design and planning by outlining and evaluating previous works, introducing the Structural Roaming Sorting Algorithms and evaluation indicator assessment and system development," establishing a 3D database, and developing virtual scene manipulation tools

3. Materials and Method

3.1 Structural Roaming Sorting Algorithm

While showing and internally calculating three-dimensional graphics, all vertices are expected to be represented by homogeneous four-dimensional coordinates[35-40]. The model uses the 3D coordinates (x, y, and z) to the homogeneous D coordinates $(X, Y, Z, \text{and } P)$. A 3D method is converted to be presented, and the modified model is as the following Equation (1):

$$[\mathrm{X\ Y\ Z\ P}] = \frac{[\mathrm{x\ y\ z}].\mathrm{F_p}}{[\mathrm{x^P\ y^P\ z^P}]} \tag{1}$$

Where F_p = value;
F = 4 × 4 transformation matrix.

It comprises the model coordinates after being translated, rotated, and reflected. The primary objective of the grey statistical approach is to generate whitening functions modeled after grey and the examination and tally of the items assigned by the expert group. Equation (2) states that the rotation transformation of the assigned components includes the following information in the transformation matrix:

$$[X_\propto^h\ Y_\propto^h\ P_\propto^h] = [X\ Y\ Z\ P]\begin{bmatrix} 0 & n0 & 0 & F_p \\ 0 & 0 & F_p & 0 \\ 0 & F_p & 0 & 0 \\ F_p & 0 & 0 & 0 \end{bmatrix} \tag{2}$$

An item may be rotated by the operation when it is in the position (x, y, z, 1); the procedure also involves rotation axis "h" and rotation angle ∝; as a result, is in Equation (3):

$$F_p(x, y, z, 1) = \begin{bmatrix} -sin \propto & 0 & 0 & cos \propto \\ 0 & h & 0 & 0 \\ -cos \propto & 0 & sin \propto & 0 \\ 0 & 0 & 0 & h \end{bmatrix} \tag{3}$$

Assuming that h_1 and h_2 are compatible in a reasonable manner, $I(h_1, h_2)$, the arithmetic mean $S_\propto$ according to Equation (4), the weight distribution vector of the evaluation index factor set is comprised of the fuzzy judgment weight set that two different specialists contributed.

$$S_\propto = \begin{cases} I_\propto 1 - \dfrac{\left(F_{p1-F_p2}\right)\left(P_\propto - W_{avg}\right)}{W_{max} - W_{avg}}, P_\propto \geq W_{avg} \\ I_\propto 2 - \dfrac{\left(F_{p2-F_p3}\right)\left(P_\propto - W_{avg}\right)}{W_{avg} - W_{min}}, P_\propto \geq W_{avg} \end{cases} \tag{4}$$

Where $P_\propto$ = greater fitness value
W_{max},W_{min}, and W_{avg} = population's highest, lowest, and average fitness values.

The following Equation (5) represents the optimization issue for selecting the "optimal roaming grid (n) and order (t)" given the total number of degrees of freedom $N = N_\alpha$.

$$S_\propto(x, y, z, n) = I_\propto(n, t) - \lambda \sum_{n=1}^{N_\alpha} P_\alpha . F_p(x, y, z, n) \tag{5}$$

Where λ is the estimated error, although it is a constant, under the complete number of degrees of freedom, in real-world applications, to successfully enhance the grid, the error reduction brought about by extra degrees of freedom must be as large as is practicable. Finding a collection of somewhat stable proper matching points to use as the algorithm's beginning point pair for computation is essential. Considering that there is just one initial matching set to be discovered, finding a collection of these points is an important step in the method.

The assessment indicators are analyzed and arranged in line with the landscape function of the urban landscape, leading to the formation of a criteria layer based on the plant landscape, artificial landscape, and spatial scale. Assuming that the judgment matrix $H = (k_{ij})m \times n$, where $i, j = 1, 2, 3, \ldots n$, and if $0 \leq k_{ij} \leq 1$, is a fuzzy matrix, the following generic scientific method may be used to arrange the data for the expert scoring judgment weight calculation in Equation (6):

$$T_i = \frac{\int_{i=1}^{n} k_{ij} dx + \frac{n}{2} \sum_{i=1}^{n} H_{ij}}{n(n-1)} \tag{6}$$

The following Equation, where n = fuzzy complementary judgment matrix,

It can be used to indicate the creation of a smart landscape model, and the urban landscape system based on VR technology is created following equation (7), which outlines the features and fundamental structure of the evaluation index system:

$$H_{ij} T_i = \frac{(a_1 - a_2).r \pm H_a(x, y, z)}{S_m^a \cdot S_n^a} \tag{7}$$

Where a_1 and a_2 = evaluation index system factors;
r = intelligence factor
Space S = Urban landscape system;
S_m^a and S_n^a = linked within a class and between-landscape divergence matrices.

Assume "M" is the evaluation system's "Attraction set". The local selection of assessment indicators at close sites is initially indicated, to make its mathematical arrangement clear in Equation (8):

$$f(M_a) = \begin{bmatrix} -ak + T_a & -n & -\lambda k - T_a \\ \lambda m - ak & -a^2 & 0 \\ -m & 0 & n \end{bmatrix} \quad (8)$$

Real-time adjustments to the landscape monomers' assessment qualities are made possible by interactive modification, like "floors, heights, and materials". Finding a collection of reasonably stable proper matching points to use as the algorithm's beginning point pairs for computation is essential. The following Equation (9) is produced if the smallest eigen value of the positive matrix M is set to $K_0 = a[\lambda k^2(a - r^2) + 2ka + b]$:

$$M_{ab}^{\lambda} = \begin{bmatrix} (ka + \lambda b^2) & 0 & 0 \\ 0 & (kb + \lambda a^2) & 0 \\ 0 & 0 & (ka - \lambda a^2 b^2) \end{bmatrix} \quad (9)$$

Where M_{ab}^{λ} = b-th index;

Equation (10) normalizes the data and determines the variance of each component. Function $f_k(a, b)$ = b-th index's whitening function value, k (k = 1, 2, 3,..., n) = number of grey classes.

$$f_k(a, b) = \sum_{k=1}^{m} var\left[\frac{(ka+\lambda b^2)}{(kb+\lambda a^2)}\right] \quad (10)$$

A quantitative summary of the relative importance of each assessment element concerning the upper-level components is produced by scaling the evaluation indicators often using the fuzzy scale approach of 0.1-0.9 among the schemes, where var(a, b) is the variance of each component.

Multi optimized CapsNet structure: To take the image of the urban landscape contains (WSN) 3-5G technology in the design of interactive space. The first layer of the caps net is convolution layer. Assume lower level capsules of the CapsNet to detect urban landscape content based image and output of the capsules of the CapsNet to detect their corresponding urban landscape content-based image retrieval.

$ULCRf_i^1, ULCRf_i^2, ULCRf_i^3$ (11)Let Equation (11) be the output of three branches of vectors coming from the capsules of the lower layers of CapsNet. By using the neural network, the vectors $ULCRf_i^1, ULCRf_i^2, ULCRf_i^3$ are sent to all possible parents. In a multi-optimized cap net structure to extract hierarchy urban landscape content based image in formation and then encode the content based image information into primary capsule layer of CapsNet. The vectors $ULCRf_i^1, ULCRf_i^2, ULCRf_i^3$ are multiplied by corresponding weight matrixes $U_{ij}, W_{ij}, V_{ij} i = 1,2, \dots, k$. Then the predicted vectors are as in Equation (12), Equation (13), and Equation (14).

$$\widehat{ULCR}f_{j|i}^1 = U_{ij} ULCRf_i^1 \quad (12)$$
$$\widehat{ULCR}f_{j|i}^2 = W_{ij} ULCRf_i^2 \quad (13)$$
$$\widehat{ULCR}f_{j|i}^3 = V_{ij} ULCRf_i^3 \quad (14)$$

$ULCRf_i^k$ represents i th primary capsule of CapsNet from k th branch. $\widehat{ULCR}f_{j|i}^k$ is the predict vector between j th parent capsule and i th child capsule of k th branch in CapsNet of urban landscape content-based image. The output of urban landscape content-based image retrieval the multi-scale capsule of CapsNet as in Equation (15).

$$\widehat{ULCR} = concat\left(\widehat{ULCR}^1, \widehat{ULCR}^2, \widehat{ULCR}^3\right) \quad (15)$$

$\widehat{ULCR}$ is the concat() function of the $\widehat{ULCR}^1, \widehat{ULCR}^2, \widehat{ULCR}^3$. Dynamic routing is determined between each parent capsule of urban landscape content-based image ULt_j and the prediction vector $\widehat{ULCR}$.

$$ULt_j^1 = \sum_{i=1}^{k} r_i^1 \, \widehat{ULCR}f_{j|i} \quad (16)$$

Where

$$\left.\begin{aligned} ULr_i^1 &= \frac{1}{k} \\ \sum_j ULr_j &= 1 \\ ULr_j &\geq 0 \end{aligned}\right\} \quad (17)$$

The Equation (16) is that each prediction vector contributes the same to the parent capsule of urban landscape content-based image, which is an initial state. The Equation (16) and Equation (17) is the first iteration of the given image. The third iteration routing process between ULt_j and $\widehat{ULCR}f_{j|i}$.

Adjust the routing coefficients r^1 to r^2 by the function update () is represented in Equation (18) and Equation (19).

$$ULccd^{i+1} = ULccd^{i} + \widehat{ULCR}_j \, .squash\, fn\, ULg_j \quad (18)$$
$$ULr^{i+1} = softmax\,(ULccd^{i+1}) \quad (19)$$

Where ULccd is the coupling coefficient and also $ULr^1 = 0$. Then calculate the candidates for the squashing function ULg_j as in Equation (20).

$$squash\, fn\, ULg_j = \frac{\left\|ULt_j\right\|^2 ULt_j}{1 + \left\|ULt_j\right\|^2 \left\|ULt_j\right\|} \quad (20)$$

The above Equation (20) is squashing function to the scalar vector between zero and unit length and also the vector direction is not change and ULt_j is the input vector of the j^{th}capsule in CapsNet and the norm of the vector ULt_j is the length of the module. Suppose ULt_j is short is represented in Equation (21).

$$squash\, fn\, ULg_j \approx \left\|ULt_j\right\| ULt_j \quad (21)$$

Suppose ULt_j is long (that is, unit vectors). Then the following Equation (22) is obtained.

$$squash\ fn\ gUL_j \approx \frac{ULt_j}{\|ULt_j\|} \tag{22}$$

The objective functions of the urban landscape content-based image retrieval of the multi-optimized CapsNet as in Equation (23).

$$UL\ L_M = \sum_{j=1}^{\alpha} ULTget_j \max\ (0, mam^+ - \|ULt_j\|)^2 + \lambda(1 - ULTget_j)max(0, \|ULt_j\| - mim^-)^2 \tag{23}$$

Where $ULTget_j$ represents j th target label and $\|ULt_j\|$ is the length of j th digit capsule of CapsNet.
mam^+- maximum margin; mim^- - minimum margin; λ-weight factor; the total loss is denoted by $UL\ L_M$ and is equal to the sum of the losses of all digit capsules in CapsNet.

3.2 Urban Landscape Design in 3D

3D Urban Land Database Organizations

The digital city platform is the major source of 3D model data, while 3D real scene model data of the region and important places serves as the main source of basic geographic information data. The subject data mostly consists of already-existing urban planning-related data, and they comprise "overview maps, urban topography data, electronic map data, place name address data", etc. One of the main uses of GIS is urban landscape planning since it is a powerful tool for collecting and evaluating geographical data.

3D Virtualized Scene Model Realization

The 3D model may then be displayed to provide a nice visual effect by a series of zooming, translation, rotation, or pull operations, including such extension and operations. Following the principles of reason and honesty, eliminating unnecessary model polygons, and main and secondary relationships are all essential throughout the modeling process. Figure 1 demonstrates the design outcomes using motion simulation while also achieving an all-around and three-dimensional representation of "time and space changes".

Figure 1. 3D Virtualized Urban Landscape Design Replacing a Landscape Model

3.3 Planning and Designing Systems That Use 3d Simulation and Interactive Adjustment

VR Scene's Simulation of A 3D Landscape

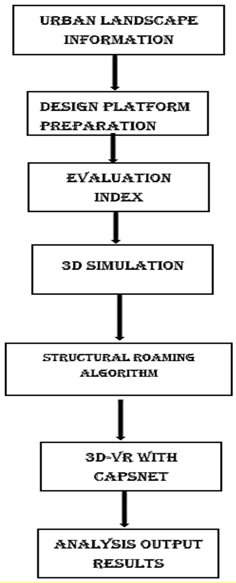

Figure 2. Flowchart for a Creation of a 3D-Visualized Metropolitan Environment using VR Technology

At all stages of planning, through overall planning to urban architecture, urban development necessitates immersive urban experiences, real-time landscape assessments, building height management, and multi-plan urban space comparison, as shown via the descriptions of the present and the future. It offers significant backing for enhancing livability and creating recognizable urban forms. Decision-makers, plan architects, urban constructors, and the general public all have diverse responsibilities to play in urban planning. Figure 2 demonstrates how this also provides the landscape model's environment, individual elements, and overall structure with a genuine aspect.

Planning and Design Systems Integration and Optimization

Figure 3. Fusion of Landscape Backgrounds for 3D Virtual Urban Landscape

The foundational and key component in the first phase of building a virtual scene model is the scale setting, and building the scene model is a crucial and foundational step. The creation of models for historic buildings makes up the bulk of the outdoor building component of the whole project. The manufacturing of numerous historic little things, including vases, tables, chairs, bed lamps, cabinets, calligraphy, and paintings, is the major focus of the inside model segment. In addition, the urban 3D model may help managers and decision-makers in urban planning and design make more precise judgments on the design's specifics, as seen in figure 3.

4.RESULT ANALYSIS AND SIMULATION

Theory of a Simulation Theory

The first-tier city technological and economic development zone, “45 km East” of this metropolis, with a projected area of around $37km^2$, is the study's chosen simulation area, the projected region. The development zone's northernmost center city, covering an area of roughly $2km^2$, serves as the simulation range. Figure 4 depicts the layout of the simulated region used in this research; solid green lines stand in for the streets or roads, and the red squares represent the grid pins.

Table 1 lists Visualized C++ as the software programming tool, Lumion 3D as the simulation driving software, and Sketch Up as the 3D modeling software. The Microsoft Access 2007 database system and Windows 10 operating system are adopted by the system development software environment.

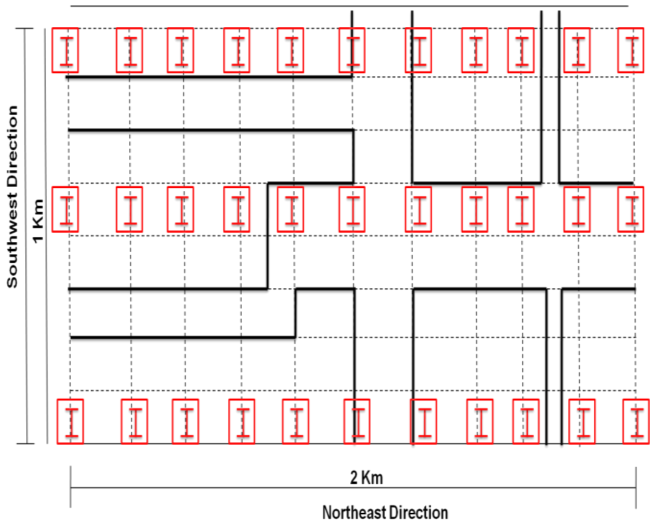

Figure 4. Floor Plan of the Research Area's Simulated Environment; Solid Green Lines Identify a Road or street, While Grid Pins Are Represented by Red Squares

Table 1. Configuring the Simulation System's Parameters

	Parameter	Value
Software platform	Operating system	Window 10 home 64-bit
	Development language	Visualized C++
	Database system	Microsoft Access 2007
	2D drawing software	AU to CAD
	3D modelling programme	Sketch Up
	software for simulation drives	Lumion3D
Hardware platform	An integrated circuit	Core i7-7700HQ by Intel
	Graphic card	NVIDIA GTX 980 M
	Accessible data storage	DDRA 32 GB
	Hard disk	SSD 1T

Analysis of Result

As mentioned above, CapsNet can enhance the computer vision tasks of virtual reality and augmented reality applications. Hence, this study used Capsnet as the significant base for determining the efficiency and performance. Throughput, energy efficiency, implementation cost, and packet delivery ratio were employed in the experiment we presented for three-dimensional virtual reality (3D-VR) with CapsNet. Comparing the proposed work (3D-VR with CapsNet) to existing approaches such as the 3D Engine Mesh Reconstruction Algorithm (3DE-MRA) [32], Virtual Reality (VR) [33], and 5G Virtual Reality Big Data (5GVR-BD) [34].

Urban landscape designing and planning is a thorough procedure that starts with the collection of the fundamental information required for preparations, continues with the development of intricate design plans, and concludes with the execution of the design or feedback on a planning's content. The home automatic generating function is chosen to utilize a landscape model's modification and replacement features, and the building is selected in the planning interface. Based on the landscape parameters of the selected place in the urban landscape architecture, a range of models would be done automatically in the 3D scene with the support of CapsNet neural model to identify the object's location in the image.

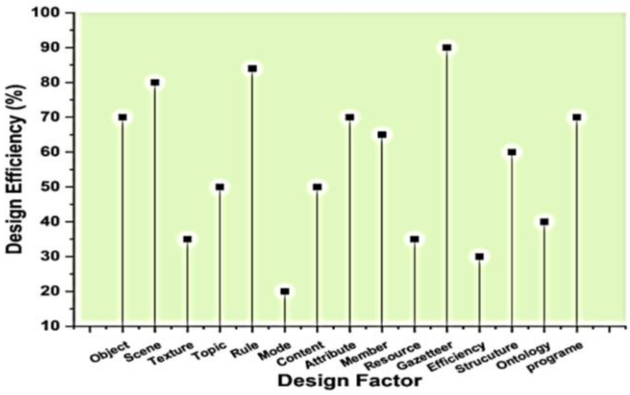

Figure 5. 3D Visualized Urban Landscape Design System Includes Design Efficiency Design Aspects

Figure 5 illustrates the success of a 3D-visualized urban landscape design. By providing design personnel with realistic information processing impacts via intelligent drawing, as shown in figure 5, VR technology significantly boosts design productivity. Measures to see whether the project team is using all available methods to optimize the design's utilization of material quantities to give the greatest capacity at the lowest cost, Gazetteer received a score of 90% in terms of design efficiency when compared to other design aspects.

Throughput is the number of information units systems can process in a given amount of time. The throughput of the present and suggested methods is shown in Figure 6. In this investigation, the throughput of the proposed work is much higher than that of the existing approaches. The suggested study is assessed in comparison to current methodologies such as 67% 3DE-MRA, 85% VR, 77% 5GVR-BD, and 95% of proposed 3D-VR with CapsNet.

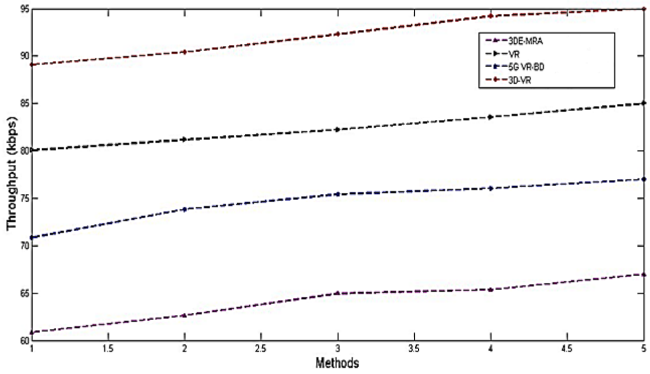

Figure 6. Comparison of Throughput

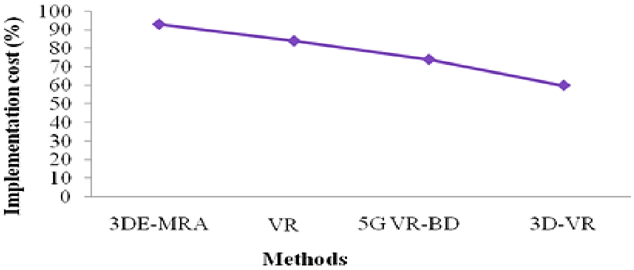

Figure 7. Comparison of Implementation Cost

Costs associated with developing and implementing an implementation strategy that focuses on one or more particular evidence-based treatments are known as implementation costs. The approach will have a direct impact on the next intervention, perhaps affecting its effectiveness, use, or quality. The implementation costs of the suggested and existing options are shown in Figure 7. In this investigation, the recommended work's Implementation is much less than that of the existing approaches. The suggested study is compared to current techniques including 93% 3DE-MRA [23], 84%VR [24], 74% 5GVR-BD [25], and 60% of proposed 3D-VR with the CapsNet neural model.

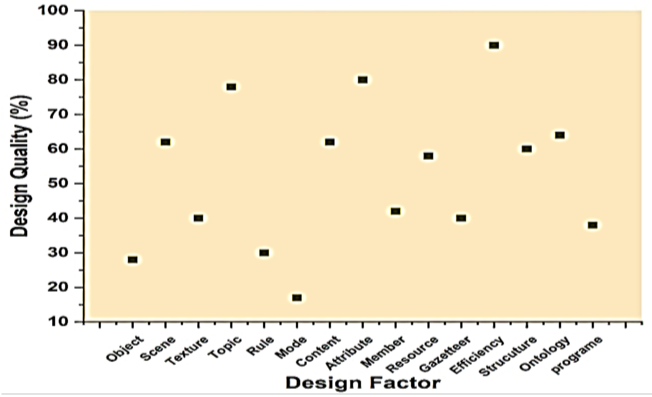

Figure 8. 3D Visualized Urban Landscape Design Platform's Design Aspects' Quality

The degree of design in 3D-rendered urban landscape architecture with the support of CapsNet neural model is seen in Figure 8. Figure 8 shows how VR technology significantly encourages the improvement of design quality. The value that a design provides to its target audience is referred to as its design quality. Design is at the heart of every aspect of quality, including the quality of goods, services, experiences, and the processes involved in their creation. When compared to the other aspects of design, the quality of the design received a score of 90%.

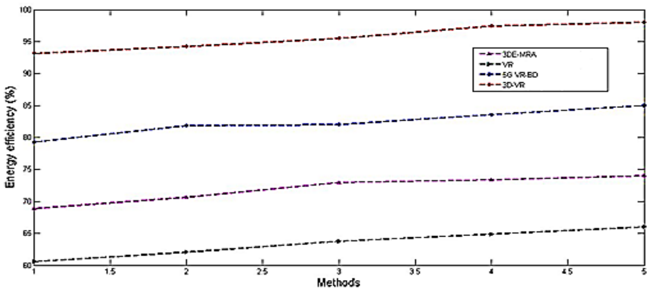

Figure 9. Comparison of Energy Efficiency

Energy efficiency is a way to quantify the amount of energy needed to provide a certain result. Figure 9 displays the energy efficiency of the recommended and current solutions. The proposed work's energy efficiency in this inquiry outperforms that of the current methods. The proposed research is contrasted with contemporary methods as 74% 3DE-MRA [23], 66% VR [24], 85% 5GVR-BD [25], and 98% of proposed 3D-VR with CapsNet.

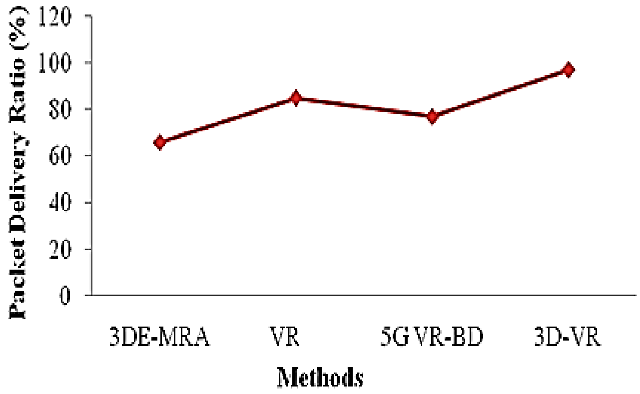

Figure 10. Comparison of Packet Delivery Ratio

The ratio of the total packet transferred to the total packets transmitted from the source node to the destination nodes is known as the packet delivery ratio which is a network measure. Figure 10 displays the Packet Delivery Ratio for the recommended and current choices. The proposed work's Packet Delivery Ratio in this inquiry outperforms that of the current methods. The proposed research is contrasted with contemporary methods as 3DE-MRA [23] 66%, VR [24] 85%, 5GVR-BD [25] 77%, and 97% of proposed 3D-VR with CapsNet.

Discussion

3DE-MRA enables us to understand qualitative characteristics of the item, such as volume and the object's location in relation to other objects in the scene that cannot be inferred from a single plane of sight. One potential limitation is the inability of 3DE-MRA to provide the surgical roadmap for biliary architecture & aberrant anatomy in either a donor or recipient (Aung et al. (2022)). Experiences are made pleasurable through VR technology. The pupils are inspired to study and get improved life skills through this technology and the high Initial Cost of Equipment and Development (Cao and Li (2022)). Instead of spending a lot on ineffective advertising activities, 5GVR-BD enables firms to provide personalized items to their target market. Big data storage using conventional storage may be quite expensive (Dong et al. (2022)). The surrounding actual environment is created through 3D virtual reality with CapsNet. It can change how WSN is delivered today, making it superior to other approaches now in use.

5.Conclusion

Urban landscape design and planning as it is typically practiced is inadequate for conveying the planning consequences of multiple systems and massive settings in a way that is clear, concise, and coordinated. With the development of Wireless Sensor Networks (WSNs) and 5G technologies, virtual reality (VR) has become an integral aspect of many facets of urban landscape design and planning. The findings demonstrate the efficacy of using a 3D visualization system with CapsNet to disseminate vast amounts of data through graphics, allowing specialists to pick up on testing results intuitively or engage in interactive processing of such data. In addition, VR's smart sketching, comprehensive display, and fast reporting have tangible effects on data processing, greatly boosting design productivity and facilitating design quality.

References

[1] Nguyen T, Dinh T, Dau VT, Tran CD, Dao DV. A wearable, bending-insensitive respiration sensor using highly oriented carbon nanotube film. IEEE Sensors Journal. 2020, 99:1–1, 2020.

[2] Dhiman G, Kumar V, Kaur A, Sharma A. Don: deep learning and optimization-based framework for detection of novel coronavirus disease using x-ray images. Interdisciplinary Sciences Computational Life Sciences. 2021, 13(2): 260–272.

[3] Raj M, Manimegalai P, Ajay P, Amose J. Lipid data acquisition for devices treatment of coronary diseases health stuffon the internet of medical things. Journal of Physics: Conference Series. 2021, 1937.

[4] Ejaz-Ul-Haq M, Hameed N, Irfan-Ur M, Khan R, Mohsin I. Temporal changes in physical signs of estrus and validation of fetal parameters for estimation of gestational stage through b-mode ultrasonography in beetal goats. Pakistan Veterinary Journal. 2020, 40(4): 425–430.

[5] Li L, Diao Y, Liu X. Ce-Mn mixed oxides supported onglass-fiber for low-temperature selective catalytic reduction ofNO with NH3. Journal of Rare earths. 2014, 32(5): 409–415.

[6] Liu W, Xing L, Yao L, Zou Z, Zhang Y. Design of portable eeg and blood oxygen synchronous acquisition system. Zhongguo yi liao qi xie za zhi = Chinese Journal of Medical Instrumentation. 2021, 45(3):280–283.

[7] Korolkov I, Knyazeva KS, Shurup AS. Theoretical and experimental studies of the correlation characteristics of signals reflected by a rotating propeller. Acoustical Physics. 2020, 66(6): 676–682.

[8] Ivant E. Experiencing Research-Creation in Urban Studies. Lessons from an inquiry on the making of public space. Cities, 2018, 77(jul.): 60-66.

[9] Werfel F N, Floegel-Delor U, Rothfeld R, Riedel T, Schirrmeister P, Koenig R, Kantarbar V. Impact of Cryogenics and Superconducting Components for HTS Magnetic Levitation Devices. IEEE Transactions on Applied Superconductivity, 2017, 27(99): 1-5.

[10] yung-Sun, Shin, Won-Pil, WonPil. A Study on the Application of Design Components of 3D Greenery. Journal of the Korea Academia Industrial Cooperation Society. 2017, 18:275-284.

[11] System for Eco-Friendly Indoor and Outdoor Space of Buildings. Journal of the Korean Society of Industrial Academia and Technology. 2017, 18(4):275-284.

[12] LIN, Xiang, Chelsea. On the Construction of Plant Landscape Form in Urban Landscape Architecture. Journal of Landscape Research. 2017, 03(v.9):90-93.

[13] Almeida N, Teixeira A, Silva S, Ketsmur M. The AM4I Architecture and Framework for Multimodal Interaction and Its Application to Smart Environments. Sensors. 2019, 19(11):2.

[14] Yao D. Wearable Sensor and Its Application in Urban Landscape Design. Journal of Sensors. 2022, 2022:1-7.

[15] Gohar A, Nencioni G. The Role of 5G Technologies in a Smart City: The Case for Intelligent Transportation System. Sustainability. 2021; 13(9):5188.

[16] Xiang L, Yanan G. Urban Landscape Design Based on Virtual Reality Technology. Advances in Multimedia. 2022, 2022:6.

[17] Wei W, Jiaxi Z. Digital Planning and Design of Landscape Based on Intelligent Sensor Network. Journal of Sensors. 2022, 2022: 9

[18] Guevara L, Auat Cheein F. The Role of 5G Technologies: Challenges in Smart Cities and Intelligent Transportation Systems. Sustainability. 2020; 12(16):6469.

[19] Bellini P, Nesi P, Pantaleo G. IoT-Enabled Smart Cities: A Review of Concepts, Frameworks and Key Technologies. Appllied Science. 2022, 12: 1607.

[20] Yulin X, Shilong J. Research on Application of 5G to Smart City″ 2021 IOP Conference Series Earth Environments Science. 2021,760:012014.

[21] Ogbodo E, Abu-Mahfouz AM, Kurien AM. A Survey on 5G and LPWAN-IoT for Improved Smart Cities and Remote Area Applications: From the Aspect of Architecture and Security. Sensors (Basel). 2022, 22(16):6313.

[22] Tuballa ML, Abundo ML. A review of the development of Smart Grid technologies. Renewable and Sustainable Energy Reviews.2016, 59:710-725.

[23] Erol-Kantarci M, Mouftah HT. Wireless multimedia sensor and actor networks for the next generation power grid. Ad Hoc Networks (Elsiver). 2011, 9 (4): 542-551.

[24] Osseiran A, Boccardi F, Braun V, Kusume K, Marsch P, Maternia M, Queseth O, Schellmann M, Schotten H, Taoka H. Scenarios for 5G mobile and wireless communications: The vision of the METIS project. IEEE Communication Magazine. 2014, 52: pp. 26-35.

[25] Yigit M, Yoney E, Gungor V. Performance of mac protocols for wireless sensor networks in harsh smart grid environment. First International Black Sea conference on communications and networking (BlackSeaCom), Batumi, Georgia. 2013, p. 50-53.

[26] Agiwal M, Roy A, Saxena N. Next generation 5G wireless-networks: a comprehensive-survey. IEEE Communications surveys and Tutorials. 2016, 18:1617-1655.

[27] Palattella MR, Dohler M, Grieco A, Rizzo G, Torsner J, Engel T. Internet-of-things in the 5G era: enablers, architecture, and business models**.** IEEE Journal on Selected-Areas in-Communications. 2016, 34 (3): 510-527.

[28] Palattella MR, Dohler M, Grieco A, Rizzo G, Torsner J, Engel T, Lathif L. Internet-of-things in the 5G era: enablers, architecture, and business models. IEEE Journal on Selected-Areas in-Communications. 2016, 34 (3): pp. 510-527.

[29] Emary IMME, Ramakrishnan S. Wireless Sensor Networks: From Theory to Applications. Taylor & Francis. CRC Press. 2013.

[30] Alohali BA, Vassialkis VG. Secure and energy-efficient multicast routing in smart grids. IEEE Tenth International Conference on Intelligent-Sensors, Sensor-Networks and Information-Processing (ISSNIP); 07-09 April 2015; Singapore. IEEE; 2015.P.1-6.

[31] Aung PPW, Choi W, Kulinan AS, Cha G, Park, S. Three-Dimensional Engine-Based Geometric Model Optimization Algorithm for BIM Visualization with Augmented Reality. Sensors. 2022, *22*(19), p.7622.

[32] Cao Y, Li Z. Research on Dynamic Simulation Technology of Urban 3D Art Landscape Based on VR-Platform. Mathematical Problems in Engineering. 2022, 2022:9.

[33] Dong H, Liang X, Liu Y, Wang D. 5G virtual reality in the design and dissemination of contemporary urban image systems under the background of big data. Wireless Communications and Mobile Computing. 2022, 2022:14.

[34] X. Liu. Three-Dimensional Visualized Urban Landscape Planning and Design Based on Virtual Reality Technology. IEEE Access. 2020, 8:149510–149521.

[35] M. N. A. Tawhid, S. Siuly, K. Wang and H. Wang, "Automatic and Efficient Framework for Identifying Multiple Neurological Disorders from EEG Signals," in *IEEE Transactions on Technology and Society*, doi: 10.1109/TTS.2023.3239526.

[36] A. M. Alvi, S. Siuly and H. Wang, "A Long Short-Term Memory Based Framework for Early Detection of Mild Cognitive Impairment From EEG Signals," in *IEEE Transactions on Emerging Topics in Computational Intelligence*, 2022.

[37] Alvi, A.M., Siuly, S., De Cola, M.C., Wang, H. (2022). DRAM-Net: A Deep Residual Alzheimer's Diseases and Mild Cognitive Impairment Detection Network Using EEG Data. In: Traina, A., Wang, H., Zhang, Y., Siuly, S., Zhou, R., Chen, L. (eds) Health Information Science. HIS 2022. Lecture Notes in Computer Science, vol 13705. Springer, Cham.

[38] Sadiq, M.T., Siuly, S., Ur Rehman, A., Wang, H. (2021). Auto-correlation Based Feature Extraction Approach for EEG Alcoholism Identification. In: Siuly, S., Wang, H., Chen, L., Guo, Y., Xing, C. (eds) Health Information Science. HIS 2021. Lecture Notes in Computer Science(), vol 13079. Springer, Cham.

[39] S. Siuly *et al.*, "A New Framework for Automatic Detection of Patients With Mild Cognitive Impairment Using Resting-State EEG Signals," in *IEEE Transactions on Neural Systems and Rehabilitation Engineering*, vol. 28, no. 9, pp. 1966-1976, Sept. 2020.

[40] He, J., Rong, J., Sun, L. *et al.* A framework for cardiac arrhythmia detection from IoT-based ECGs. *World Wide Web* **23**, 2835–2850 (2020).