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A NOVEL CSINR TECHNIQUE FOR ACCURATE AND PRECISE GPS COMMUNICATION BY GEOGRAPHICAL CENTRIC SELF-LEARNING NODES

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Abstract. Since its introduction, the Global Positioning System (GPS) is finding many countless, useful, and emergency applications, focused mainly on track. As the technology is advancing day by day and the best feature of GPS, which does not, relies on mobile signal to work, making it a feasible feature to incorporate into other devices as functionalities. By adopting GPS to a system, accurate mapping and geographical labeling can be obtained. GPS works better with the coordination of nodes and requires centralized monitoring and a reporting system. As it is a known fact that a demerit follows merit anywhere else, In GPS also, the major attention is required to make the nodes to success in mapping the intermediate space between agent node used for reporting and the remaining nodes of a cluster, where satellite and node coordination can be possible integer ambiguity technique. Many researchers have proposed solutions to the aforementioned problem; unfortunately still today the proposed methods are weaker in achieving lesser time delay of Total Electron Content (TEC). The proposed Centric Self-Learning Interconnected Nodes Reading (CSINR) technique is novel in terms addressing the intermediate nodes failing to label the inter-connected object spaces between reporting agents and nodes using integer ambiguity technique for node co-ordination and using a dedicated GPS prediction-based clock system, which predicts precise and accurate mapping between interconnected nodes. Based on the information shared between among the network managers a separate pseudo-connected network will be formed and further this network will be considered an interconnected nodes network. From the information calculated from temporal factors and clock offset the separate pseudo network is extracted by using the proposed CSINR technique. Add-on self-improvement is introduced to the proposed method by a self–learning feature to an individual join extract the principal rate of partisan neighbouring join to sustain accuracy in order consistent basis. An evaluation ratio of 97.43%, sensitivity of node occurrence is resulted as 92.78% and accuracy of 97.43% & 97.12% is achieved among a cluster of 32 & 64 nodes respectively.

Key words: Mapping of GPS Nodes, Position Accuracy, Precision of GPS Nodes, Self-Learning nodes, co-relation.

AMS subject classifications. 68T05

1. Introduction. Peer-peer communication among nodes is a fundamental and primary requirement for a stable network that works for multi-dimensional attributes and functions. It is inferred that the distance between the satellites and receiver is calculated by considering the product of the time delay (τ) and the velocity of light (c). A net of 24 satellites positioned into an track forms a GPS navigation system and it is finding its profound role in achieving network stability and thereby making track able. At the time of its introduction, it was intended for only military applications, but later on, it spread its wings to other civilian applications. GPS would have not been a successful technological development applied for a reliable communication environment for multiple applications, services, and techniques until unless without node coordination between each and every node in the network. Under a dynamic communication system, GPS provides paperless transportation logs and records [1], by means of continuously tracking the movement and monitoring of nodes via a given. GPS works by rotating its satellites around the earth double a day and transmits signal in sequence precisely to the earth. Then Receivers on earth determine the user's literal site by using triangulation, compare time delay between a signals transmit by a satellite through the time it was established, and estimate distance of a specific satellite. Further with the distance difference between the remaining satellites in the orbit, the receiver be able

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to settle on the user's spot and put on show from its 2D and 3D spot (longitude, latitude and altitude) and mark it on the user's electronic map. This information is further used to know the exact speed, trip distance, total distance between transmitter and receiving node, day and night time duration calculation. As the GPS communication depends on the nodes, nodes should be formed as a cluster, and any one of the node will be selected as a cluster node for monitoring the trustiness of every node in the cluster and the number of nodes in the is fixed in number and it is fixed. Clusters can be made as per the area of authorization. Clusters can be making any number. But if it will be fixed number then accuracy will be better. More number of clusters are there, then accuracy will be good.

Along with the advantages GPS has profound challenges in terms of achieving exact and accurate location of GPS coordinates. The author of [2] has presented an elaborated survey report of multiple techniques involving fundamental computations defined to achieve precision and accuracy of GPS coordinates. Further, the difficulties have been addressed in [3] with Smartphone tracking-based evaluation. Dealing with the smartphone based GPS node coordination is much more complex, as it involves mobile nodes, and dynamic nodes, which may leave or enter the network at any time. Under such scenarios, GPS is vulnerable to polling of crowd node, controlling of conjunction of GPS node difficulty, and issues with management nodes. Assurance of overall coordination among GPS nodes can be easily achieved by mapping to a particular antenna. The above-mentioned issues were addressed in the proposed methodology by means of a systematic approach and evaluated in terms of reliable solutions and frameworks for accuracy prediction of GPS nodes. In the following section various existing research solutions were elaborated and in III section the detailed methodology of planned technique is introduced. In IV section Statistical model and design and proof of the findings were included further results and discussion and comparison with the existing methodologies along with future scope are included in Section-V.

2. Literature Survey. As it is known fact that for a reliable tracking and monitoring of source node movement and location is accurately achieved by the Global Positioning System (GPS) based on geometric coordinates. Unfortunately, GPS System is more vulnerable to man in middle attacks, black-hole attack, Spoofing and unauthenticated node tracking issues. Author [4] have proposed a reliable framework solution in terms of inactive coordinates of GPS and the false nodes coordination log information of duplicate nodes of the network. The proposed method also deals with such type of fake nodes and corrects the long time travel behavior of unexpected node of the network. The mentioned methodology provides support in terms of node traceability and verifies authenticity of accessing. Handling of large volume of data, generated by the process is addressed in [5] proposed an optimization technique adopted for data collection in big-data management environment, thereby achieving accurate mapping of GPS nodes.

A more detailed method used to process and analysis the information related to mapping and reliability is proposed [6] which is used to generate a secure GPS location accessing. Author named as the Standard Positioning System (SPS), provides a generalized representation of overall coordinates associated for communication and hence a- centralized monitoring is un assessed, to overcome the challenge a dedicated monitoring and positioning system is required for evaluation. A customization and processing approach for improved behavioural mapping in GPS based outset is evaluated. These customizations are predominant and have influence of coordinate recommendations for modern technological assistance. The geometric parameters of information collection via GPS coordinates are evaluated under a timely manner based paradigms to assure the dependency of time and coordinates under the operations.

The overall coordination required for essential communication and hence a centralized monitoring is unassessed. Further the security threats of central monitoring system and the following challenges of a dedicated monitoring and positioning system were addressed in [7] and a solution for GPS based outset is proposed in terms of a customized behavioral mapping among the nodes. Modern technological assistance can be achieved by a network formed with such a customized and predominant coordinates in the network. The author [8] have proposed an interlocked data transfer solution for handling information breeching in multi-node environment named as in TelMED [8].

Authors of [9] have proposed timely mannered paradigms to collect the information related to the geometric parameters via GPS coordinates. The proposed method works with the assumption of dependency of time on its coordinators operation. It is a known fact that the information transmission via wireless network is

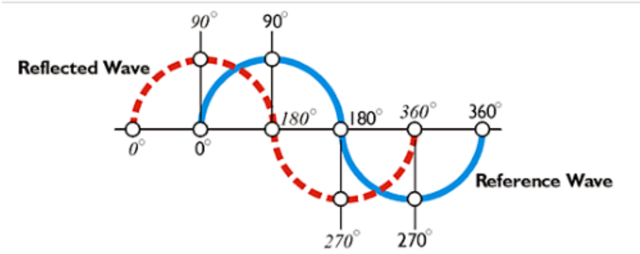

Fig. 3.1: Integer Ambiguity Problem Illustration

more vulnerable to security attacks and a solution is proposed to procure the dependency of data in wireless network. A draft of all over analysis report of dependency and growth rate of GPS nodes is presented in [10] and also covered the current time challenges of GPS processing followed with the road map of development towards the near future. An agile and low cost GPS tracking method is proposed in [11] and resulted a more reliable customized system for allotting permission for incoming request and also accessing of locations. A self-learning system with the aim of accurate and reliable polling and mapping of GPS coordinate for a secured communication. A detailed report of ICT along with its role in customized network following with its challenges was presented in [12]. Authors have proposed a methodical idea for valuing the situation of GPS coordinates system mapping.

3. CSINR: Centric Self-Learning Interconnected Nodes Reading technique. As we know that in GPS,the measurement of the difference in the phase of the incoming signal and the phase of the internal oscillator in the receiver reveals the small distance at the end of a range.

By comparing the phase of the signal returned from the reflector with the reference wave it kept at home, an EDM can measure how much the two are out of phase with one another. However, this measurement can only be used to calculate a small part of the overall distance. It only discloses the length of a fractional part of a wavelength used. This leaves a big unknown, namely the number of full wavelengths of the EDM's modulated carrier between the transmitter and the receiver at the instant of the measurement. This cycle ambiguity is symbolized by N. Fortunately; the cycle ambiguity can be solved in the EDM measurement process. The key is using carriers with progressively longer wavelengths. For example, the sub meter portion of the overall distance can be resolved using a carrier with the wavelength of a meter. This can be followed by a carrier with a wavelength of 10 meters, which provides the basis for resolving the meter aspect of a measured distance. This procedure may be followed by the resolution of the tens of meters using a wavelength of 100 meters. The hundreds of meters can then be resolved with a wavelength of 1000 meters, and so on as shown in fig.3.1.

Here is that comparison, the reference wave in blue with the reflected wave with the dashed red line. The reflected wave came back out of phase by a quarter of a wavelength. With an EDM, wavelengths of varying length can be sent out. For example, if the EDM sends out a wavelength of 100 meters, then by looking at the fractional part of that 100-meter wavelength, it would be possible to determine the tens of meters in the distance. The hundreds of meters of the overall distance could be resolved by sending out a wavelength of 1,000 meters and looking at the fractional part (by phase comparison). This method depends on the fact that the EDM survey can send out waves of different wavelengths and have them return to where they came from. That makes comparison of the returned wave with the reference wave possible. By comparing phase angles, the fractional part of the wavelength that went out can be determined. The components of the total distance are built up by sending on wavelengths of different size; first the thousands of feet, then the hundreds of feet, then the single feet, and finally the decimals of feet. However, this whole method is not possible in GPS surveying. There are only three carriers; L1, L2, and L5. They have constant wavelengths. Therefore, while it's possible to determine the fractional part of the wavelength, that one small component of the distance, from a single measurement, knowing the number of full wavelengths between the receiver and satellite is more difficult. This is known as the integer ambiguity problem.

Another important parameter to consider in the GPS communication is Total Electron Content (TEC), which is the time delay of Total Electron Content Total electron content (TEC) is an important descriptive quantity for the ionosphere of the Earth. TEC is the total number of electrons integrated between two points, along a tube of one meter squared cross section, given in equ(3.1) i.e., the electron columnar number density. It is often reported in multiples of the so-called TEC unit, defined as $TECU = 1016el/m2 \approx 1.66 \times 10 - 8m$. The TEC is path-dependent. By definition, it can be calculated by integrating along the path ds through the ionosphere with the location-dependent electron density ne(s):

$$TEC = \int n_e(s)ds \tag{3.1}$$

TEC is significant in determining the scintillation and group and phase delays of a radio wave through a medium. Ionosphere TEC is characterized by observing carrier phase delays of received radio signals transmitted from satellites located above the ionosphere, often using Global Positioning System satellites. TEC is strongly affected by solar activity.

The CSINR technique aims at improving the reliability in intermediate node space which is helpful in improving the accuracy of GPS nodes mapping. The process of GPS coordinate system definition and information gathering starts with defining Node Attribute Extraction (NAE), which captures the information of active node in terms of its initial parameters through the antenna. This information technically includes, the location of users (U_n) and a stream of nearst locations will be formed.

A matrix which extracts the inter-related node primary to NAE is framed with many attributers and association ratio information of the network. As shown in Fig.3.3 a novel clustering method is proposed and named as the Static User Grouping (SUG), which provides an accurate customizable and reliable solution for node allocation and defining the space relationship to improve the network performance further. This is an internally evaluated node base invention of co-relationship matrix. Another improvement of self proposed method is withdrawal of inter-reliant medium of GPS coordinates is proposed, evaluated by categorizing nodes separately from the activity of each and every node in the coordinate system.

The novelty of the proposed technique is a dedicated GPS clock prediction is proposed to predict precision and mapping among the interconnected nodes. The interconnected nodes are dependent on the information shared via network managers and hence, CSINR technique extracts the nodal relationship of interconnected nodes to build a pseudo connected network based on temporal factors and clock offset. The Fig.3.4 shows the above said node extraction and categorization combined with the proposed method for point to point node interaction and for the selection of cluster node. Further, a cluster head node will performs the inner auditing of nodes standards $(N_{01}\ to\ N_{0n})$ in every categorized prevailing conditions (Y_i), which can be further customized. The collected data from the cluster node is further processed a matrix called summation matrix defined for ensuring the synchronization between each and every node of the network. A threshold value is fixed from the information calculated from the timepiece pre-set and equalize coordinates of GPS site denoted as a f_o. Information related to node existing from the network with respect to reporting agent can be easily obtained by a static user grouping technique as shown in Fig. 3.2. CSINR Spatial Representation method is used to yield the worth of the template coordinates as in Fig.3.4, and it is a work of fiction method as a region tagging where R_X is the inner zone dependency value and Z_X is the outer zone dependency value. The nodes of the proposed method are self-learning and extracts extract the principle value of supporting neighbouring nodes to maintain reliable source accuracy information. The proposed method generates the co-relationship matrix that is important because Based on the co-relationship matrix we may know the nodes which are fixed and which are movable. With this matrix we can validate the nodes. With this matrix we can find the suitable path to communicate the data.

The proposed technique is improvised by adopting filtering method to overcome the Integer Ambiguity problem. In filtering approach, independent measurements are averaged to find the estimated position with the lowest noise level. A third use a search through the range of possible integer ambiguity combinations from which it calculates the one with the lowest residuals. These approaches can't assess the correctness of the particular answer, but they can provide the probability with certain conditions, that the answer is within given limits.

A clear understanding of CINR technique under each node of GPS tracking is clearly presented by the 3D model of spatial representation as shown in Fig. 3.5. The process under node extraction, by the customizing

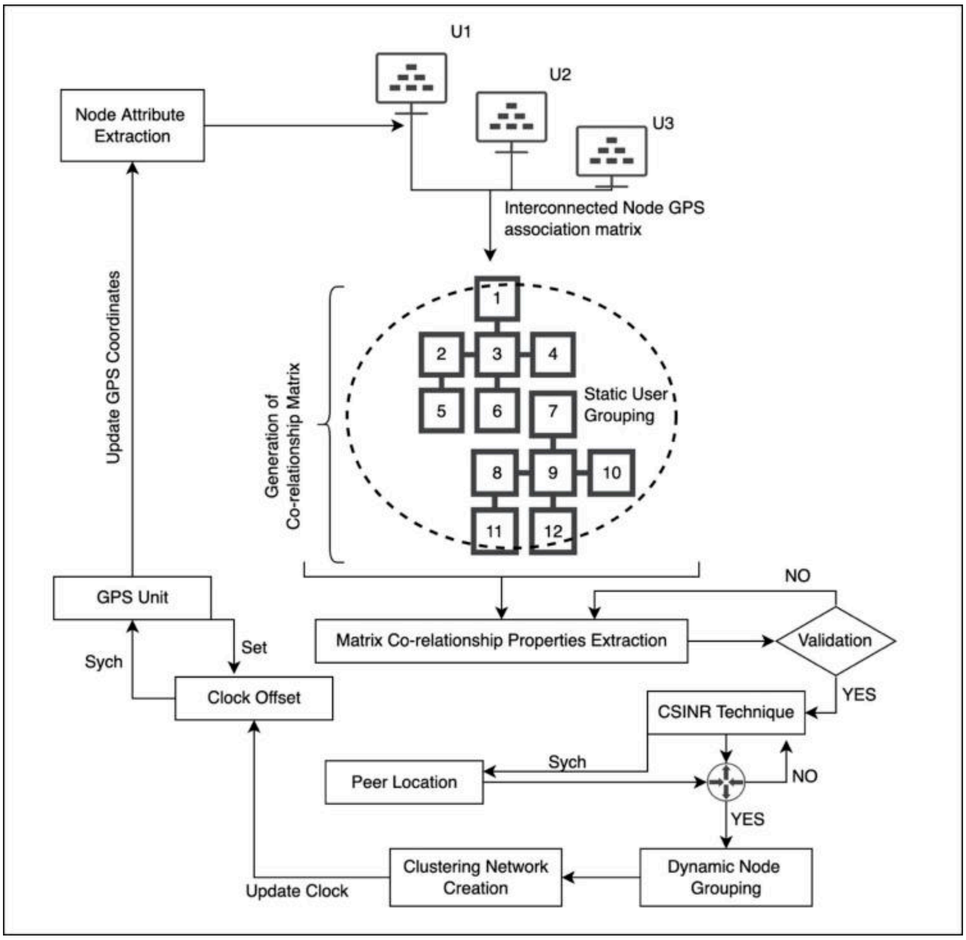

Fig. 3.2: Block representation of CSINR technique

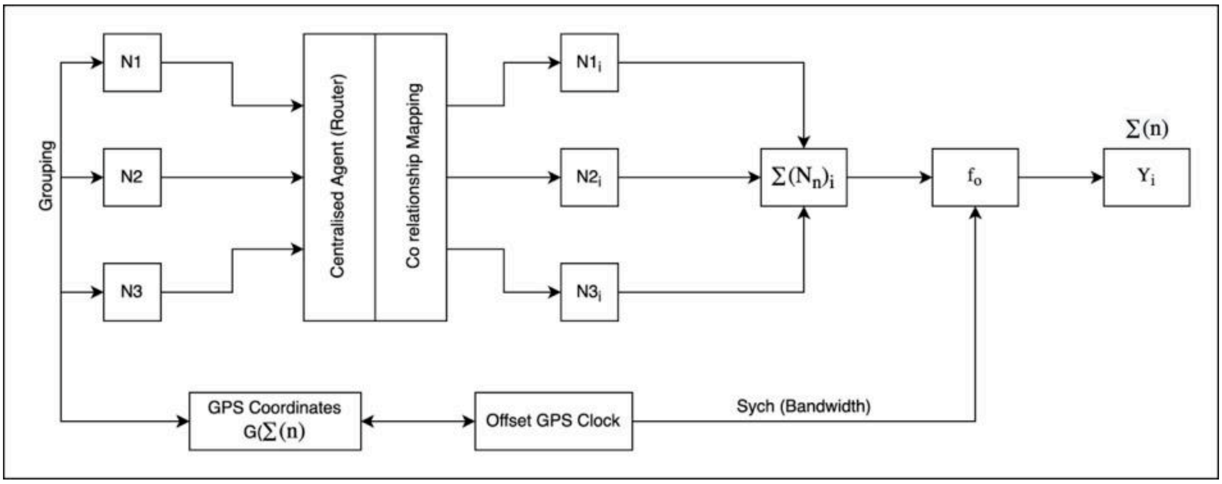

Fig. 3.3: Static Clustering CSINR Technique

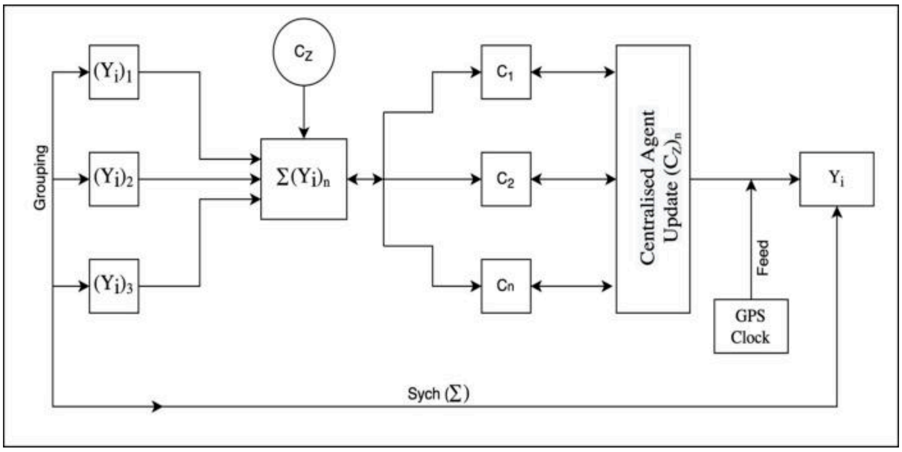

Fig. 3.4: Dynamic Clustering CSINR Technique

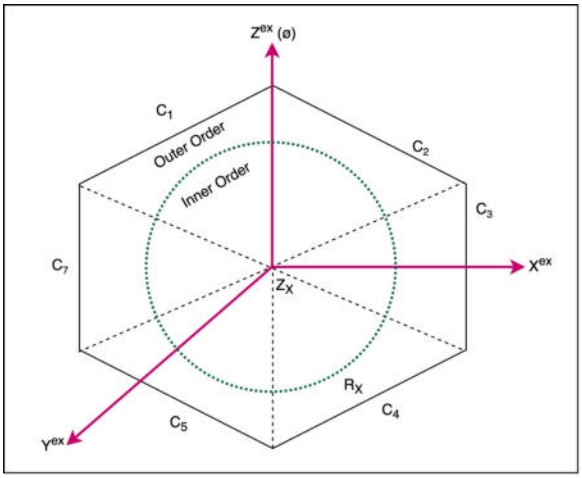

Fig. 3.5: Cluster Representation

the inner zone and outer zone categorized as static nodes and the outer zone is as lively nodes. As values exceeding the doorstep and hence extract parameter also restricted so there by projection observation curve will also be maximized. The nodes information related to entry and exit from the network and the information of node capturing and categorization will taken care by the cluster head.

4. Statistical Approach. Another challenging task of GPS is formation of a hexagonal cell as the GPS coordination is completely dependent on node interconnection. Let $G = \{G_1, G_2, G_3 ... G_n\}$ is the GPS factor of a device and is authenticated to monitoring server$\{D_n\}$such that $\{G_i \Rightarrow D_n\}$under an order of$[r, s, t]^i$; Receiver (*'r'*), Sender(*'s'*) and bit of transmit value('t'). Normally, it shows below

$$\{D_n\} = (P_i + G_i) \Rightarrow \left(\mathrm{P}_i + [r, s, t]^{G_i}\right) \tag{4.1}$$

$$D_S = \left(\sqrt{\left(\sum_{i=0}^{\infty} D_{Si}\right)}\right) - \Delta G \tag{4.2}$$

Where $\Delta G$is an aligned and optimized value of a GPS system with $\{D_S\}$and arriving GPS standards (G*)* as $\{G \subseteq \Delta G\}$by means of position to $\{D_S \Rightarrow\} L\left(\Delta G\right)$, here *'L'* means the place of ΔG and habit. Precisely, the sort of sites (L) by a underneath issue of $[r,s,t]^i$is represented as below.

$$r = \sqrt{\left(r - r_i\right)^2 + \left(r - r_{i+1}\right)^2 + \left(r - r_{i+2}\right)^2 + ...} \tag{4.3}$$

$$S = \frac{1}{\sqrt{r\left(r - r_i\right)^2}}\overrightarrow{\Delta G} \tag{4.4}$$

$$t = \sum_{i=0}^{\infty}\left(r_i \to \left(\sum_{j=0}^{n}\Delta L_i \frac{\Delta G_j}{\partial t}\right)\right) \tag{4.5}$$

The value of each parameter information is communal in the provide $[r,s,t]^i$sector is evaluated and factorized and GPS Coordinates is evaluated by considering the incoming factor *(*I_f*)*. Equation 4.6 represents the room harmonization of every sign rate is represented.

$$[I_f] = \left| \begin{array}{cc} \cos\theta^{\dagger}\sin\varphi & \left(\sin\theta^{\dagger}\cos\varphi + \sin\varphi\cos\theta^{\dagger}\right) \\ -\left(\cos\theta^{\dagger}\sin\varphi\right) & \left(-\sin\theta^{\dagger}\cos\varphi - \sin\varphi\cos\theta^{\dagger}\right) \\ \sin\varphi & -\sin\theta + \cos\varphi \end{array} \right. \tag{4.6}$$

From the event occurrence and alignment of GPS coordinates the cyclic spaces are evaluated and filtered. The factorial value $[r,s,t]^i$of all joint by orientation to bandwidth din provincial values is represented as (U_{acc}) and $(U_{inc})$to arranging again an reliable join below the provided procedure room.

$$(U_{acc}) = \lim_{n\to\infty}\left(\int_{i=0}^{n}\frac{\delta\left(I_f\right)_i}{\delta t}\right) - \Delta G_i[r,s,t]^i \tag{4.7}$$

$$(U_{inc}) = \lim_{n\to\infty}\left(\frac{\Delta G\left[\delta\left(I_f\right)_i\right]}{\delta t} - \sum_{j=0}^{n}\left(\frac{\delta\left(\Delta G_i\right)_j}{\delta t} \oplus \Delta G\right)\right) \tag{4.8}$$

$$U = U_{acc} \oplus U_{inc} \tag{4.9}$$

U_{acc} and U_{inc} are inserted in U_i .

$$\delta U\left(t\right) = \frac{\delta\left(U_{acc}\right)}{\delta t} \oplus \frac{\delta\left(U_{inc}\right)}{\delta t} \tag{4.10}$$

$$\delta U\left(t\right) = \sum_{i=0}^{\infty}\sum_{j=1}^{n}\left\{\frac{\delta\left(U_{acc}\right)_i}{\delta t} \oplus \frac{\delta\left(U_{inc}\right)_j}{\delta t}\right\} \tag{4.11}$$

$$\delta U\left(t\right) = \sum_{i=0}^{\infty}\sum_{j=1}^{n}\left\{\frac{\delta\left(U_{acc}\right)_i \oplus \delta\left(U_{inc}\right)_j}{\delta t}\right\} \otimes G_i \tag{4.12}$$

$$\overrightarrow{\delta U\left(t\right)} = \lim_{n\to\infty}\left(\frac{\Delta G_i[r,s,t]^i}{\Delta \mathrm{T}\left(0.248\right)}\Delta G_i\left[\frac{\delta\left(Ut\right)}{\delta t}\right]_0^{\infty}\right) \tag{4.13}$$

$$\overrightarrow{U(t)} = \left(\frac{\Delta G_i[r,s,t]^i}{\Delta \mathrm{T}\,(0.248)} \left\{ \lim_{n\to\infty} \left(\sum_i^{\infty} \sum_j^{n} \left(\frac{\delta U(t)_i}{\delta t} \oplus \frac{\delta \overrightarrow{U(t)}_j}{\delta t} \right) \right) \right\} \right) \tag{4.14}$$

$$\overrightarrow{U(t)} = \left(\frac{\Delta G_i[r,s,t]^i}{\Delta \mathrm{T}} \left\{ \lim_{n\to\infty} \left(\sum_{i,j}^{n} \left(\frac{\delta U(t)_i \oplus \delta \overrightarrow{U(t)}_j}{\delta t} \right) \Delta G_i \right) \right\} \right) \tag{4.15}$$

$\delta U_i \Rightarrow \delta U(t)$ are primary ideals of GPS coordinators of utilize (U) underneath a agreed atmosphere ofΔG. The same are additional implemented by a balanced calculation on or after old user labels $U_{acc}$and next to him jointU_{inc}. All joints are consistent and mold of next-door GPS truth is calculated and processed. It show in Eq. (4.9) and will be shown as Eq. (4.16):

$$e(t) \Rightarrow \delta\left(eU_{acc} \oplus eU_{inc}\right)^{\mathrm{T}} \tag{4.16}$$

Where, $eU_{acc}$and eU_{inc} are the ecological changeable that are linked to the join or consumer room (T) through ($\forall \mathrm{T} \subseteq \Delta G$)and ($\Delta G \in eU$)as all (U) customers are allied among near join values in the defined environment of operation.

The essential situation of consumer action $\left(\overrightarrow{U}\right)$beneath the process rule of$\left(\delta U \Rightarrow \delta\left(\overrightarrow{U(t)}\right)\right)$ the self knowledge gaining method re give the track and breathing space of action from side to side which the accepted consumer is below genuine process. Think the acquiring knowledge by own label (S_P) beneath the power of background *(e)* uneven as $\left(S_P \in e^{\mathrm{T}}\right)$here *'T'* is maximum location given with in specified area. The joint (n) is collaborated as $S_P = [(n_i)_1, (n_i)_2, (n_i)_3 ... (n_i)_n]$such that $\left(\forall S(n_i) \Rightarrow \forall e^{\mathrm{T}}\right)$with a underneath variable of self-governing characteristic.

Based on Eq. 4.15 & 4.16, the basics of consumers $(\delta(u))$site ascription is equated with an independent factor values (V_f)such that each of $(V_f) \Rightarrow \forall e^{\mathrm{T}}$in user $U_{acc}$and $U_{inc}$is coordinated. The medium of customer's contains with own learning is shown in Eq. 4.17 .

$$S_P = \left\{ \begin{array}{c} \left(\frac{\delta(U_{acc} \oplus U_{inc})}{\delta t}\right) \otimes \Delta G_i \\ \left(\frac{\delta(U_{acc} \oplus U_{inc})}{\delta t}\right) \otimes \left[(V_f)_i\right]_0^n \end{array} \right. \tag{4.17}$$

$$S_P = \left\{ \begin{array}{c} \left(\frac{\delta(U_{acc} \oplus U_{inc})}{\delta t}\right) \otimes [r,s,t]^{\mathrm{T}}\,\Delta G_i \\ \left(\frac{\delta(U_{acc} \oplus U_{inc})}{\delta t}\right) \otimes \sum_{i=0}^{n} \left[(V_f)_i\right] \Delta G_i \end{array} \right. \tag{4.18}$$

The reliance reason of several standards attributes in consumer $U_{acc}$and $U_{inc}$is reliant on $[r,s,t]^{\mathrm{T}}$aspect, the starting arrangement sort to remove and build up a factorial terms to $[\Delta G_i]$where$[\forall G \subseteq \Delta G_i \cup \Delta L_i]$ gives all stations covered as pieces and needy to consumers site coordinates. Believe place $[\Delta L]$getaway represents in Eq.4.19 .

$$[L] = \left(\frac{\delta(U_{acc} \oplus U_{inc})}{\delta t}\right) \cong \left(\frac{\delta(r)^{e\mathrm{T}}}{\delta t} - 0.728\Delta\mathrm{T}\right) \tag{4.19}$$

$$[\Delta L] = \left(\frac{\delta(U_{acc} \oplus U_{inc})}{\delta t}\right) \cong \left(\sum_{i=0}^{n} \frac{\delta(r)^{e\mathrm{T}}}{\delta t} - 0.728\Delta\mathrm{T}\right) \tag{4.20}$$

Equation (4.20) is a learning paradigm of location and orientation of a node. The proposed methodology achieves ode reliability as user to consumer communication parallel as given by Eq. (4.19) & Eq. (4.20) in that order. The GPS nodes are monitored and recorded from the orientation mapping information of GPS neighboring nodes. Recording can also includes a simulated environment also named as node_name for easier identification and location extraction. From the line of scope *(Ios)* information the node attribute, occurrence and, precision of node mapping can be easily evaluated.

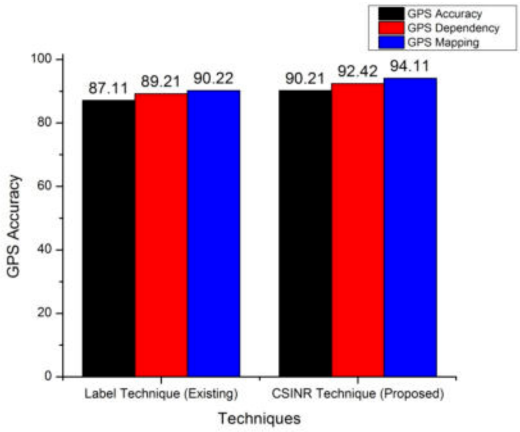

Fig. 5.1: Comparison of CSINR with existing methods

Table 5.1: Comparative validation of proposed

	Plot method	**Label procedure**	**Suggestion method**	**CSINR method**
GPS potency (hz)	2.872	2.8933	2.922	2.9421
label standards (%)	87.22	88.22	92.34	94.93
GPS standards (arbb)	81.88	92.00	90.32	97.64
Nominal space (m)	3.30	4.211	4.23	4.90
Changeable space (m)	0.46	0.46	0.49	0.91
Outcrop arc (m)	3.69	3.89	3.93	3.93

5. Results and Discussions. The reason why to prefer the proposed method over the traditional geometric method is because thisis the strategy requires a significant amount of satellite motion to succeed, and, therefore, takes time to converge on a solution. It works pretty well, but requires satellite motion and takes time to converge.

By proposing a clustering method a higher order user grouping can be achieved from the information of in progress site of Global position system coordinates as explained the aforementioned sections. The collected in turn are further processed and evaluated and updated to the central monitoring reporting agent. Further, comparative analyses of all existing methods are presented in Fig. 5.1 and it is clear that the proposed (CSINR) technique is showing better performance in terms of accuracy over others. Proposed technique is also differing from the existing methods from the join way of showing and site baggage.

The agenda of information breeching through multi-agent information sharing systems has to be optimized and generate a system interlocked approach for data transfer is proposed for secure and reliable data communication using inter-domain information systems. The fundamental concept behind this approach is to secure the data dependency under open channel communication line.

Table 5.1 summarizes the existing systems with the proposed system in terms of GPS potency, Labeled standards, GPS standard, nominal distance, and Variable distance and Project Curve parameters. From the table.5.1, it is inferred that the proposed methodology is showing better performance over the existing methodologies. The proposed methodology is showing improved projection curve over the other techniques and a percentage of 5 over the Plotting technique and 2 over the Labeled Technique and further it is used for an accurate and reliable prediction of GPS coordinates. Table 5.2 shows a comparison between the proposed and existing systems by means of TEC for a cluster of 5, 9, 17, 33, 65 nodes respectively and delay comparison graph is shown in Fig. 5.3 and with respect to Signal to Noise Ratio is shown in Fig. 5.4 respectively. The

Table 5.2: Total Electron Content v/s CSINR

Nodes	TEC Delay (ms)	CSINR Delay (ms)	TEC (SNR)	CSINR(SNR)	TEC (Accuracy %)	CSINR (Accuracy %)
5	23.69	21.52	44.22	43.20	88.36	93.22
9	33.93	32.89	48.22	47.20	89.29	93.95
17	42.10	39.19	49.33	47.30	90.33	94.05
33	47.00	43.10	53.33	48.34	90.92	94.76
65	50.34	48.20	55.84	49.44	91.45	97.33

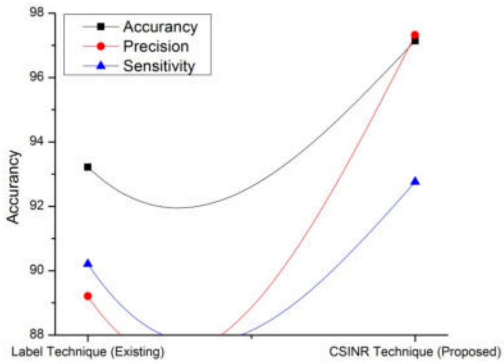

Fig. 5.2: CSINR with old methods

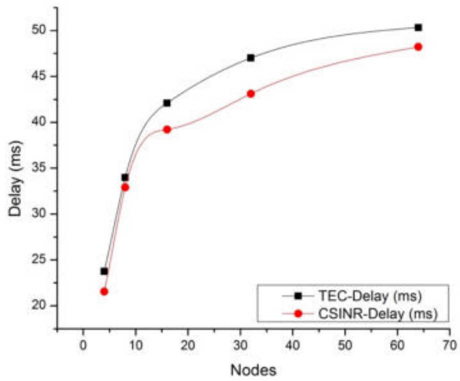

Fig. 5.3: CSINR comparison with TEC in terms of Time Delay

proposed method provided an improved accuracy of 97.32% for 64 bits as Fig. 5.5.

6. Conclusion. By adopting a strong complex and secure encryption technique along with proposed technique achieves secure data transmission under multiple cyber physical attacks such as black-hole monitoring, spoofing and unauthorized coordinates tracking between the nodes can be easily achieved.

A committed and a good number steadfast methodology was proposed accurate finding and attaching of GPS coordinates. The experimental setup of proposed method includes MATLAB2016 has required and expected instrument package. Results show that proposed modus operandi completes an improved accuracy

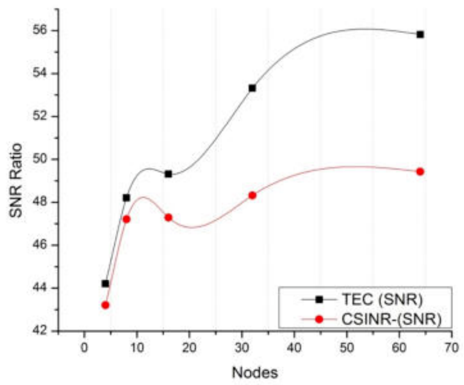

Fig. 5.4: CSINR comparison with TEC in terms of SNR

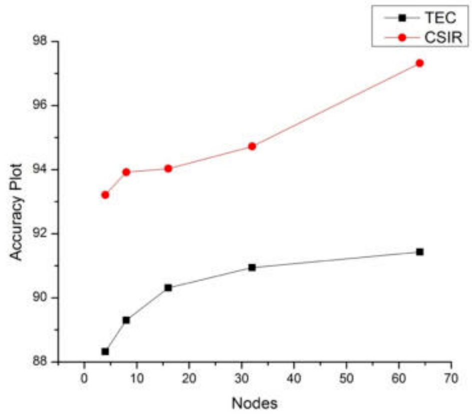

Fig. 5.5: CSINR comparison with TEC in terms of Accuracy

with 97.32% over the Total Electron Content (TEC). Proposed technique can be employed for location extraction under attribute based environment and also for inter-connected co-relationship mapping. A reliable communication is possible by developing a imitation matrix hexagonal system provides consistent announcement environment. The technique of self-learning provides the data dependency and precision mapping for GPS coordination. The CSINR based method is providing an accuracy of 97.32% and 96.82% in inter-domain GPS coordinate system. The proposed method can be used in future for lively consumer tagging and alliance.

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