Research Article

Remote Monitoring Application in Treatment of Gynecological Inflammation Based on Association Rule Algorithm

Qian Manjuan

Department of Obstetrics and Gynaecology of the Second People's Hospital of Nantong, Nantong, Jiangsu 226002, China

Correspondence should be addressed to Qian Manjuan; 2007032@muc.edu.cn

Received 12 June 2022; Revised 7 July 2022; Accepted 22 July 2022; Published 16 August 2022

Academic Editor: Shadi Aljawarneh

Copyright © 2022 Qian Manjuan. This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

The storage center of the main data of the information system is called the database, and the database is often attacked. The traditional database security mechanism based on identity authentication and access control is a passive security mechanism that focuses on prevention, which cannot ensure the security of modern databases. This study analyzes the remote monitoring application in the treatment of gynecological inflammation based on the association rule algorithm. Medical remote monitoring can be realized through 5G technology, smart wearable devices, etc., and online HD consultation and medical image data synchronization can be realized through wired video. Based on the analysis of the unique query structure of the database, this study makes a comprehensive discussion on the theory and method of database anomaly detection technology and focuses on how to integrate data mining methods such as association rules and clustering into the database anomaly detection. The results show that the medical examination system in this study can effectively improve the medical level of gynecology, and has practical significance in the clinical practice of gynecological inflammation. With the development of 5G technology, there will be more remote monitoring medical equipment connected to the Internet, health information can be transmitted to professional health institutions, real-time monitoring of users' physical health through big data, and timely provision of health guidance and early warning.

1. Introduction

Due to the gradual development of information technology in various fields of society, people not only benefit from the wide range of opportunities given by information reform but also face the baptism of information security [1]. Because of the objective existence of system security vulnerabilities, it is difficult for operating systems, application software, and hardware devices to guarantee that there will not be many security problems. According to past experience, safety problems are unavoidable [2]. As intrusion methods continue to be enriched and more difficult to predict, it is difficult to follow the intruder and prevent the intrusion in advance. Traditional passive security such as access control technology based on identity authentication, multi-level security mechanism for controlling information flow, data encryption and firewalls, etc [3]. The mechanism can no longer meet the needs of the security situation. As an active security prevention mechanism, an intrusion detection system is the ultimate line of defense for security detection and has received more and more attention [4]. The main concept of the future 5G network architecture design is user-centric, which requires the 5G network to be capable of on-demand networking and flexible deployment for various business scenarios [5]. The 5G network can meet the diverse needs of users and its traffic has grown on a large scale and the number of user terminals has increased sharply. However, the traditional packet core network is incapable of facing the diversification of the service industry, which makes it difficult to meet the needs of diversified services. With the diversified development of service objects and business scenarios, a dedicated plan is designed for each business or service, but the high cost and extremely low resource utilization make the plan extremely unrealistic [6]. Gynecological inflammation is a disease that often occurs in female genitalia. It has a great impact on girls' bodies and
minds, and the situation is not optimistic. Therefore, it is necessary to conduct research on gynecological inflammation [7]. This article discusses the symptoms, causes, diagnosis, and treatment of this disease, and provides a reference for the treatment of gynecological inflammation with integrated Chinese and Western medicine. The so-called gynecological diseases are the diseases of female reproductive organs we often say, including uterine diseases and vulvar diseases [8]. Through investigation and research on relevant medical materials, it can be found that more than 85% of women will have symptoms of gynecological inflammation, but the degree of disease is different, and most gynecological inflammations may have repeated attacks when they actually occur. If women themselves suffer from gynecological inflammation but fail to find out and carry out the targeted treatment the first time, it will not only have a huge impact on women's bodies, but also increase their chances of suffering from cervical cancer and pathological changes [9]. Therefore, we must solve our own problems through medical means in time for our physical discomfort, adopt some effective methods for treatment, and strengthen the prevention of diseases. This is of great significance for protecting women's health.

2. Related Work

The literature puts forward the concept of a multi-dimensional set, mathematical model, and its measurement space. It also talks about using multi-dimensional association rules to change the algorithm APMA-MSSD. Using its unique algorithm APMA-MSSD, the performance of running together is more perfect than running directly [10]. The concept of multi-dimensional collections and the semantics of the association rules of multi-dimensional collections is to change data from a single value to multiple values, so that it can be used by multi-valued data mining. The literature talks about the irregularity detection algorithm AD_Density based on the metric space. AD_Density uses density clustering data design to standardize the appearance and combine it into a metric index tree, so that searching with a fast speed is its detection process. In addition, density clustering is not sensitive to external structures and noisy sounds [11]. Therefore, this algorithm is used to make up for the problem of Lenoid and other anomaly detection algorithms based on cluster analysis, such as the detection rate of the impact of performance degradation in the metric space and the data distribution algorithm of the training set. This method can be regarded as irregularity checking of the database, and its core algorithm will be used for irregular checking of the database. This is because the database understands the characteristics of the metric space, and it is recommended that the APMA-MSSD algorithm be used in irregular checking of the database [12]. The nature and variants of the application. According to the literature, on the basis of a system with a high degree of trust, the hidden channels are eliminated by rolling back the confidentiality level of the transaction manager that works well in confidentiality, while maintaining the modularity and minimization of the trusted computing foundation [13, 14]. The security lock protocol is a highly reliable security database. The problem that must be solved is the realization of the hidden channel in the two-phase lock protocol and the need to maintain regionalization, which enriches the existing transaction protocols [15]. The literature introduces the research direction, existing technology, and existing problems of database anomaly detection technology, discusses the research and consideration of database anomaly detection systems in implementation technology and implementation mode, and also answers the benefits and methods of various technologies and methods for this purpose [16]. Finally, the data development technology is explained, especially the development of association law and the application of cluster analysis in irregular inspection, and the research on its benefits and problems that should be eliminated. The literature first talked about the concept of multi-dimensional sets, and then answered its similarity calculation method [17]. In addition, the mining algorithm for association rules of multi-dimensional sets is discussed, and examples are analyzed. Finally, the application of multi-dimensional sets in database irregularity checking is introduced. It explained its multi-level relationship simulation, and then, the classification strategy was discussed. In order to better observe the effects of treatment and preventive health care for common gynecological diseases, we select some patients with gynecological diseases and divide them into two groups arbitrarily.

3. Abnormal Database Access Detection and Medical 5G Network Application

3.1. Database Abnormal Access Detection. There are multiple well-ordered sequences in the same group because the inclusion relationship is a partial order relationship, as shown in Figure 1.

Calculating the similarity between sets and sets can be used to find suitable sets for matching or clustering, etc. These applications are set in similarity. Its measurement usually increases with the increase of the set and its value. Experience shows that past research has found a large number of set similarity measurement methods, in which up to five coefficients such as formulas (1)–(5) are used.

\[
\text{sim}(X, Y) = |X \cap Y|,
\]

(1)

\[
\text{sim}(X, Y) = \frac{2|X \cap Y|}{|X| + |Y|},
\]

(2)

\[
\text{sim}(X, Y) = \frac{|X \cap Y|}{|X| Y|},
\]

(3)

\[
\text{sim}(X, Y) = \frac{|X \cap Y|}{\sqrt{|X| \ast \sqrt{|Y|}}},
\]

(4)

\[
\text{sim}(X, Y) = \frac{|X \cap Y|}{\min(|X|, |Y|)}.
\]

(5)
The given attribute set conforms to the total order relationship, and the formula of its average method similarity is shown in the following formula:

$$\text{sim}_{avg}(t_1, t_2) = \frac{\sum_{i=1}^{n} \text{sim}(S_i, R_i)}{n}$$  \hspace{1cm} (6)

The distance formula is as the following formula:

$$\text{dist}_{avg}(t_1, t_2) = 1 - \text{sim}_{avg}(t_1, t_2).$$  \hspace{1cm} (7)

The given attribute set conforms to the total order relationship, and its multiplicative similarity formula is as shown in the following formula:

$$\text{sim}_{mul}(t_1, t_2) = \prod_{i=1}^{n} \text{sim}(S_i, R_i).$$  \hspace{1cm} (8)

The distance formula is as the following formula:

$$\text{dist}_{mul}(t_1, t_2) = 1 - \text{sim}_{mul}(t_1, t_2).$$  \hspace{1cm} (9)

The similarity formula is shown in the following formula:

$$\text{Esim}_{avg}(t_1, t_2) = \frac{\sum_{c \subseteq A \cap B} \text{sim}_{bag}(S_c, R_c)}{|A \cup B|}.$$  \hspace{1cm} (10)

The distance formula is as the following formula:

$$\text{Edist}_{avg}(t_1, t_2) = 1 - \text{Esim}_{avg}(t_1, t_2).$$  \hspace{1cm} (11)

For any $d \in D$, the number of elements whose support degree of $d$ in package $s$ is equal to $d$ is defined as the following formula:

$$\text{sup}(d, s) = |\{v | v \in s \wedge v = d\}|.$$  \hspace{1cm} (12)

The similarity between $s$ and $t$ is as in the following formula:

$$\text{sim}_{bag}(s, t) = \frac{\sum_{d \subseteq c} (\text{sup}(d, s) + \text{sup}(d, t))}{|s| + |t|}.$$  \hspace{1cm} (13)

The formula for similarity between $t_1$ and $t_2$ is shown in the following formula:

$$\text{Esim}_{mix}(t_1, t_2) = \frac{\sum_{c \subseteq A \cap B} \text{sim}_{bag}(S_c, R_c)}{|A \cup B|}.$$  \hspace{1cm} (14)

The distance formula is as the following formula:

$$\text{Edist}_{mix}(t_1, t_2) = 1 - \text{Esim}_{mix}(t_1, t_2).$$  \hspace{1cm} (15)

The dimensionality subsets of 2000 transaction action characteristics $A1$ and $A3$ with an average frequent item length of 3 are each obtained as 0.75 support and 0.25 reliability. This example uses 2000 transaction action characteristics with an average frequent item length of 4 as $A2$. The subset of dimensions. The most important thing is to let the dimensional subset get 2000 three-dimensional data sets according to the characteristics $A1$, $A2$, and $A3$ as the experimental data. If the pruning effect is compared by selecting the total number of elements, the results are shown in Table 1.

If the Apriori algorithm is used to obtain the support of the selection set without other algorithms, then all the data sets should be used when performing this operation, and the APMA-MS algorithm does not need to be other as long as the attribute column can be added.

Therefore, the transaction read subset (d) of Figure 2 is the amount of data read by the unit. Figure 2 shows the method of increasing the value of the minimum support. The reduction is easier to see, and the value of adjusting the support of the cube reaches the minimum. The algorithm is the longest known frequent item, and the number remains the same.

The multi-dimensional model is longer. Figure 3 compares with the FP-Growth algorithm and finds that the FP-Growth algorithm has better performance in the long-mode processing. Hardware environment: based on Intel structured microcomputer, CPU: Pentium 2.80 GHz, memory 512M, software environment: Windows2000 server.
SolServer2000, using Netframework for programming. As long as the data set is scanned, it is regarded as a search and read of the database, and the test results in different dimensions are shown in Figure 3.

Under different threshold $\delta$, the clustering results are shown in Table 2. The larger the $\delta$, the greater the similarity between the internal members of the cluster, and the more compact the internal structure of the cluster.

Therefore, the clustering algorithm generates more clusters, especially small clusters. As shown in Table 3.

Table 4 shows the results of executing three read queries A, B, and C on an account relationship. If the value of the attribute in the execution result set is regarded as a one-dimensional set or wrapped in each attribute, and the order relationship with the attribute is regarded as a fully-ordered relationship, the query result can be regarded as a set of true multi-dimensional hybrids.

3.2. Medical 5G Network. The spectrum efficiency at each user base station is as shown in:

$$\eta_{i,j} = \log_2(1 + \text{SINR}_{i,j}).$$

(16)

The signal-to-interference-to-noise ratio is shown in formula:

$$\text{SINR}_{i,j} = \frac{P_j \cdot h_{i,j}}{\sum_{k \in J, j \neq j} P_i \cdot h_{i,j} + \sigma^2}.$$  

(17)

Assuming that a user can only request one service at a certain time, a user can only connect to one base station as in:

$$\sum_{j \in J \cup I^0} x_{i,j} = 1, \forall i \in I^0 \cup I^0.$$  

(18)

There is no doubt that the base station will not enter without restraint. The maximum number of objects that can be entered by any base station $j$ is as in:

$$\sum_{i \in I \cup I^0} x_{i,j} \leq u_{i,j}, \forall j \in J.$$  

(19)

For user $I$, the maximum data transmission rate of user $I$ can use Shannon’s formula as:

$$R_i = \sum_{j \in J} x_{i,j}y_{i,j}B_i \eta_{i,j}, \forall i \in I^0 \cup I^0.$$  

(20)
The slack variable can be understood as the probability range of all bandwidth resources allocated by $I$ is less than or equal to the bandwidth resources of the $j$ base station is shown in:

$$\sum_{i \in I_j} x_{i,j} y_{i,j} \leq 1, \forall j \in J.$$  \hspace{1cm} (21)

MBBe film is to ensure the transmission rate and throughput of mobile broadband services. It not only ensures that all users on the MBBe chip meet the lowest throughput and latency performance but also improves the user’s lowest throughput as much as possible. Therefore, the performance evaluation index of MBBe is defined as the minimum throughput as:

$$a \equiv \min_{i \in I} R_i.$$  \hspace{1cm} (22)

Compared with other services, the obvious feature of the RLLCu chip is that it needs ultra-low time delay as in the formula.

$$b \equiv \max_{i \notin I} \frac{L_i}{R_i}.$$  \hspace{1cm} (23)

Part of the mathematical model of the optimization problem is shown in:

$$\max \{ wa - (1 - w)b \}, \frac{e}{8u} - BOP.$$  \hspace{1cm} (24)

The slack variable can be understood as the probability that user $i$ connects to base station $j$, so the connection plan between base station $j$ and user $i$ is as shown in:

$$\max_{y_{i,j}} \{ wa^* - (1 - w)b^* \}, (BAP).$$  \hspace{1cm} (25)

Four base stations are designed in the experiment. The distance between each base station is 250 m. The radius of any base station is 200 m. The types and positions of users under any base station are arbitrarily placed. The placement of users and base stations is shown in Figure 4.

The rule in this study is that the maximum number of user connections for each base station is 20, and the specific simulation parameters are shown in Table 5.

Figure 5 shows the performance analysis with the weight value $w$.

### 3.3. Application of 5G Network in the Medical Field

China has a vast territory and uneven allocation of medical resources. In order to make it easier for patients to see a doctor and make it more convenient for patients to receive diagnosis and treatment by authoritative experts, remote consultation technology has emerged. In the past, the general online consultation production and maintenance process required a lot of effort, and it was not convenient to move. It will be realized through wired video. The 5G network can use 4K/8K online high-definition consultation and medical image data to synchronize in time. This is all because of the high speed of the 5G network. This performance allows experts to make timely and efficient judgments and treatments. Improve the efficiency of diagnosis and treatment and on-site guidance. Teaching is of great significance to surgery teaching. Traditional medical surgery observation and teaching are mainly performed on-site in the operating room or through video recording. The number of participants in on-site teaching is small, and the teaching and research efficiency is low. For some minimally invasive surgery, it is unable to connect to medical equipment and does not have the conditions for observation and teaching. Surgical video recording methods have problems such as the camera being electromagnetically interfered with by the surgical equipment, and the image effect is poor or cannot be recorded at all. The application of 5G network and 4K medical equipment can display the operation screen in high-definition, the operating room and the conference center can communicate with audio and video, and the whole process of the operation can be broadcast live through audio and video communication. 5G network performance is good, smooth live broadcast and communication screen, no lag, clear details of the picture, and smooth sound transmission. At present, the application of 5G remote surgery teaching has been carried out in many provinces and cities and has achieved good results.

For example, the Gansu Provincial Health and Family Planning Commission relied on the provincial telemedicine information platform and used telecom 5G network
**Table 5: Simulation parameters.**

| Parameter              | Numerical value | Parameter              | Numerical value |
|------------------------|-----------------|------------------------|-----------------|
| Base station           | 4               | Noise power            | $10^{-13}$W     |
| User                   | 0–80            | Base station transmission power | 46 dBm         |
| Channel model          | 3D-uma          | Base station bandwidth | 20 MHz          |
| Base station spacing   | 250 m           | Carrier frame rate     | 2 GHz           |

**Figure 4:** User base station distribution ($u = 60$).

**Figure 5:** System performance changes with weight $w$. (a) Minimum throughput of the EMBB service, (b) maximum transmission delay for URLLC services, (c) average throughput of the EMBB business, and (d) average transmission delay of URLLC service.
technology to carry out the first surgical tele-teaching activities, and simultaneously promoted multiple provincial-level medical institutions to access the telemedicine platform. Experts from the Gansu Provincial Hospital of Traditional Chinese Medicine demonstrated the entire process of the decompression operation of the lumbar 5/sacral 1 nucleus pulposus through the laminar approach under local anesthesia through the provincial telemedicine information platform in the operating room. And the team’s analysis in the process is very complete. Gansu Provincial Department of Health, Gansu Provincial Hospital of Traditional Chinese Medicine Online Consultation Center, Gansu Provincial Health Commission used 5G networks to interact with the online medical platform dispatch center. The 5G network can enable the rapid spread of medical technology to the grassroots level and has a profound impact on the improvement of China’s medical standards.

Remote monitoring can be achieved through 5G technology, smart wearable devices, etc. Medical monitoring and data transmission devices are worn or implanted in the human body using computer technology, the Internet, and the Internet of Things, such as glasses, watches, bracelets, anklets, jewelry, rings, necklaces, etc., in real-time, accurately and efficiently. It records human vital signs information and pathophysiology, and quickly displays it to patients and doctors through cloud transmission and analysis technology, making medical treatment, prevention, diagnosis and treatment, follow-up and other processes comfortable, convenient, and accurate. Health functions have become one of the core concerns of smart wearable devices. For example, smartwatches can provide functions such as ECG, atrial fibrillation monitoring, and real-time synchronization of health data to the cloud. With the development of 5G technology, there will be more remote monitoring medical equipment connected to the Internet, health information can be transmitted to professional health institutions, real-time monitoring of user health through big data, and timely health guidance and early warning.

4. Discussion on Treatment and Prevention of Gynecological Inflammation

4.1. Understanding of Gynecological Inflammation and Causes. Gynecological inflammation is characterized by recurring episodes and most women lack an accurate understanding of this. Many female friends have abnormal leucorrhea, genital itching, waist, and abdomen pain. They do not pay attention. They do not get treatment as soon as possible. Delays and missing the most suitable treatment time will cause them to evolve into other more serious chronic diseases. Chronic inflammation takes a long time. There are many disadvantages, and it is easy to get sick again after knowing it, which has a serious impact on the girls’ bodies and minds, and makes the patients even more uncomfortable. If it is not treated quickly, it will easily develop into a serious infection of the reproductive system, which can easily lead to female infertility and ectopic pregnancy. Data show that about 15% of gynecological tumors in the world each year are caused by inflammatory infections.

Gynecological inflammation is a common gynecological disease for Chinese women. It has a great impact on women’s physical and psychological quality. The location and types of gynecological inflammation are different, so it will cause a variety of symptoms, such as bad smell, abnormal leucorrhea, irregular physiological cycle, etc. Gynecological inflammation is divided into acute and chronic, acute gynecological inflammation may also be complicated with peritonitis, so that its stomach reaction is severe; Chronic pain usually makes girls feel bloating and pain in their stomachs and discomfort in their back. Leucorrhea is not normal, generally thin serous and abnormal color may also be accompanied by cervical erosion.

Since the female’s vulva is not protected and the urethra and anus are close to each other, urination and defecation may lead to vulva pollution, which makes the vulva in a humid environment for a long time and is the breeding ground of various bacteria. Therefore, this physiological structure makes the growth and reproduction of bacteria more convenient. In addition, the monthly menstrual period of girls will be more likely to make genital infection inflammation. The female genitalia, such as the damage caused by tight vulva, frequent and violent sexual intercourse during underwear activities, as well as unsanitary underwear, unsanitary sexual intercourse, and poor immunity, are often infected by different bacteria, resulting in the outbreak of inflammation. Improper artificial medicine and the destruction of the balance of vaginal flora can also cause gynecological inflammation. Western medicine treatment of gynecological inflammation is mainly used to treat patients with inflammation and treat them with antibiotics. In addition, because of the popularity and promotion of antibiotics, antibiotic-resistant strains are increasing, drug resistance is strengthened, and the effect is more and more unsatisfactory and easy to relapse. The disease can not be effectively controlled, often get sick again, and greatly reduce the quality of life of patients.

4.2. Investigation Process and Results of Gynecological Inflammation Treatment. A total of 100 patients with gynecological inflammation in our hospital from May 2019 to April 2020 were studied. All patients were in the range of common gynecological diseases, and they were randomly divided into two groups. In the control group, they were treated in the usual way, but they were not given preventive health education. In the other group, they were given preventive health education while they were treated as usual. For the experimental group with preventive health care treatment, both the treatment results and the patients’ liking degree are far higher than those in the normal treatment group. The difference between the two groups is significant, as shown in Table 6.

The basic symptoms of patients in the experimental group were significantly improved when the preventive health care treatment was implemented, and the degree of liking was significantly improved. Among them, 37 cases liked it, 11 cases were OK, and 2 cases didn’t. The total liking degree was 96%. In the other group, 11 cases liked it, 23 cases
were OK, and 16 cases didn’t. The total liking degree was 68%. See Table 7 for details.

4.3. Discussion on Treatment and Prevention of Gynecological Inflammation. Women’s body immunity will gradually weaken with age. If an unreasonable diet is standardized and lacks good hygiene habits, the incidence rate of gynecological diseases will increase. Gynecological common inflammation and symptoms: (1) Vulvar inflammation is the inflammation of the vulva or mucous membrane, mainly by a variety of bacterial infections or vaginal genital secretion of liquid infection caused by the disease. Symptoms are genital pruritus, discomfort, burning, even swelling, rash, erosion, ulceration. The disease for a long time will make the skin thickness increase, rough, dry crack, and more serious is the hair growth moss. (2) Vaginitis is the genital mucous membrane’s outer wall and the connective tissue under the outer wall of the disease. It is basically when the self-defense function of the genitals is damaged, the virus enters and causes infection. Symptoms: genitalia produce more liquid, the odor has been difficult to accept, and severe pain after sexual intercourse. (3) Cervicitis caused by persistent infection of pathogens. Symptoms are the clinical effect of vaginal discharge is significant, which can improve the therapeutic effect of surgery, accelerate the recovery of patients after surgery, and make it easier for patients to recover, so it is necessary to apply it in clinical practice.

All in all, women with gynecological problems should attach great importance to and actively treat gynecological inflammation, learn relevant knowledge completely and skillfully, and learn how to prevent gynecological inflammation. Gynecological inflammation belongs to lumbago, stomachache, and other areas in TCM. The syndrome differentiation can be divided into damp heat injection type, spleen deficiency and dampness supplement type, kidney yin deficiency type, cold coagulation, and blood stasis type. The combination of topical and systemic medicine has a strong effect on repairing uterine tissue and promoting the healing of gynecological inflammation.

5. Conclusion

The key problem of database security is whether it is comprehensive and valuable. In the past, the main work of normal database security law is prevention, which should focus on the investigation of external users, so that the behavior of users is legal and avoid user behavior violations. However, the database security mechanism has great limitations, which can not prevent the abuse of legitimate users’ rights and some identity spoofing network attacks, such as password sniffing, session hijacking, and so on. Therefore, it is a reliable method to make up for the deficiency of traditional database security mechanisms by intrusion detection. The existing research on intrusion detection mainly focuses on the host or network intrusion detection, while the research on the database as the core supporting software of information processing is less. The data in the database has its own structure and semantics, and the database users have their own unique behaviors. Through database intrusion detection, we can make up for the shortcomings of operating system and network intrusion detection, and improve the accuracy and effectiveness of detection. Based on the analysis of the unique query structure of database, this study makes a comprehensive discussion on the theory and method of database anomaly detection technology and focuses on how to integrate the data mining methods such as association rules and clustering into the database anomaly detection algorithm. On this basis, some other key technologies of the secure database are also discussed. The research work of this study puts forward some new ideas and directions for the research of secure database technology. In this study, the current clinical treatment process of gynecological treatment of common diseases and treatment of specific programs are studied, and according to the actual situation to develop the corresponding preventive measures.

Data Availability

The data used to support the findings of this study are available from the corresponding author upon request.

Conflicts of Interest

The authors declare that they have no conflicts of interest.

References

[1] A. Mukherjee, S. A. A. Fakoorian, J. Huang, and A. L. Swindlehurst, “Principles of physical layer security in multiuser wireless networks: a survey,” IEEE Communications Surveys & Tutorials, vol. 16, no. 3, pp. 1550–1573, 2014.
[2] T. Jiang, T. Li, and J. Ren, “Toward secure cognitive communications in wireless networks,” IEEE Wireless Communications, vol. 19, no. 4, pp. 82–88, 2012.

[3] S. Sicari, A. Rizzardi, L. A. Grieco, and A. Coen-Porisini, “Security, privacy and trust in internet of things: the road ahead,” Computer Networks, vol. 76, pp. 146–164, 2015.

[4] A. Mpitziopoulos, D. Gavalas, C. Konstantopoulos, and G. Pantziou, “A survey on jamming attacks and countermeasures in WSNs,” IEEE Communications Surveys & Tutorials, vol. 11, no. 4, pp. 42–56, 2009.

[5] F. Yu, C.-C. Chang, J. Shu, I. Ahmad, J. Zhang, and J. M. de Fuentes, “Recent advances in security and privacy for wireless sensor networks,” Journal of Sensors, vol. 2015, no. 1, Article ID 169305, 2015.

[6] Z. Wang, Z. Zhou, H. Zhang, G. Zhang, H. Ding, and A. Farouk, “AI-based cloud-edge-device collaboration in 6G space-air-ground integrated power IoT,” IEEE Wireless Communications, vol. 29, no. 1, pp. 16–23, 2022.

[7] F. Ishmanov, A. S. Malik, S. W. Kim, and B. Begalov, “Trust management system in wireless sensor networks: design considerations and research challenges,” Transactions on Emerging Telecommunications Technologies, vol. 26, no. 2, pp. 107–130, 2015.

[8] J. I. Shim, A. K. W. Han, H. J. Jeon et al., “Clinical experience of uterine smooth muscle tumor of uncertain malignant potential in two gynecological centers: oncological and obstetrical aspects,” European Journal of Obstetrics & Gynecology and Reproductive Biology, vol. 246, pp. 7–13, 2020.

[9] M. Virarkar, D. Ganeshan, C. Devine, R. Bassett, V. Kuchana, and P. Bhosale, “Diagnostic value of PET/CT versus PET/MRI in gynecological malignancies of the pelvis: a meta-analysis,” Clinical Imaging, vol. 60, no. 1, pp. 53–61, 2020.

[10] H. Kameyama, Y. Shimada, K. Abe et al., “Digestive surgery intervention for gynecological malignant tumor,” Gan To Kagaku Ryoho Cancer & Chemotherapy, vol. 46, no. 13, pp. 2176–2178, 2019.

[11] M. I. Ali, F. Feng, X. Liu, W. K. Min, and M. Shabir, “On some new operations in soft set theory,” Computers & Mathematics with Applications, vol. 57, no. 9, pp. 1547–1553, 2009.

[12] C.-C. Hsu, C.-L. Chen, and Y.-W. Su, “Hierarchical clustering of mixed data based on distance hierarchy,” Information Sciences, vol. 177, no. 20, pp. 4474–4492, 2007.

[13] T. Zhang, R. Ramakrishnan, and M. Livny, “BIRCH: an efficient data clustering method for very large databases,” in Proceedings of the ACM SIGMOD International Conference on Management of Data, pp. 103–114, ACM, Montreal, Canada, June 1996.

[14] U. Azad, B. K. Behera, E. A. Ahmed, P. K. Panigrahi, and A. Farouk, “Solving Vehicle Routing Problem Using Quantum Approximate Optimization Algorithm,” IEEE Transactions on Intelligent Transportation Systems, 2022.

[15] A. Yener and S. Ulukus, “Wireless physical-layer security: lessons learned from information theory,” Proceedings of the IEEE, vol. 103, no. 10, pp. 1814–1825, 2015.

[16] W. Xu, W. Trapper, Y. Zhang, and T. Wood, “The feasibility of launching and detecting jamming attacks in wireless networks,” in Proceedings of the 6th ACM International Symposium on Mobile Ad Hoc Networking and Computing (MobiHoc’05), pp. 46–57, ACM, Chicago, Ill, USA, May 2005.

[17] S. Zahra, M. A. Ghazanfar, A. Khalid, M. A. Azam, U. Naeem, and A. Prugel-Bennett, “Novel centroid selection approaches for KMeans-clustering based recommender systems,” Information Sciences, vol. 320, pp. 156–189, 2015.