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A SURVEY ON TRM ANTEENA ARRAY FAILURE CORRECTION

Jaspreet kaur and Amandeep kaur

UCOE, Patiala

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A B S T R A C T

A wireless communication system, an antenna array is one of the most important part of improving system capacity and spectral efficiency. Active antenna array is widely used in many applications, such as satellite communication, sonar, for signal acquisition purpose mobile communications. The array antenna system is installed outdoors for too long. Thus, a number of factors, such as solid-state devices, including semiconductors and integrated circuits and RF circuits, or changes in the active device performance may degrade the performance of the entire system deteriorates. Distortion of the beam pattern reduces the overall system performance. Typically, due to the large number of elements in an antenna array consisting of an array of a large number of radiating elements presented, there is always a possibility of the antenna array system failure or a plurality of elements. Destruction of elements in the array fails symmetry, and dramatic changes in the electric field strength can cause an array of side-lobe level increase distortions in the form of graphics. In some cases, like the space platform to replace defective array element is not possible.

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INTRODUCTION

Digital beam forming array antenna systems can detect or track targets and enable communication by electrically synthesizing the desired beam pattern and steering the beam direction [1]. The array antenna system is installed outdoors for too long. Thus, a number of factors, such as solid-state devices, including semiconductor integrated circuits and degradation of performance and RF circuit, or change the active device may reduce the overall system [2] performance [3]. The transmitter / receiver module (TRM) to reduce the volume of the distorted beam pattern; i.e., side-lobe level (SLL) increases. Beam pattern distortion reduces overall system performance [4].

Thus, resynthesizing the optimal beam pattern is essential in order to improve system performance effective resynthesizing will be more cost-effective and will increase the time between module replacements, thereby increasing the array availability [5]. In order to achieve maximum performance of the antenna system, the resynthesized pattern should be as similar to the original beam pattern as possible. Resynthesizing the optimal beam pattern can be recalculated to receive mode, without fail TRMS distribution of amplitude and phase to achieve.

Trm antenna

Antenna and Antenna Network

An Antenna is an intermediate which could easily transmit, send and receive signals, such as microwaves radio or satellite signal. Antennas send signals, receive signals, or both. Antenna changes the signal in the air into electricity [6]. Antenna radiates the energy into all direction. All wireless devices contain an antenna, or either an evident pole on the external network. In proposed work we have used bidirectional antenna in the system [7].

Wherein the antenna is a network topology comprises a sensor Systematic several radio communication network node. Antenna network can be viewed as a special type of self-organizing wireless network. Antenna networks usually have more configuration programs, and may be set so that in addition to the available dynamic exceeds a certain geographic area, in a cost-effective connection. The ad-hoc network, the former hand, as long as the network is a particular wireless device to prepare ad hoc within communication range of each other. Sensor router may be moving, and the precise demand by the network generated representation can be stimulated. Often Sensor router is not limited in resources relative to other network nodes, the use of resource-intensive to do more functions. In this manner, the antenna network is different from the

Corresponding author:* **Jaspreet kaur
UCOE, Patiala

self-organizing network. While these specific nodes is often controlled by resources.

In addition to having an antenna network node or add fresh node occasional failure relatively stable topology. The accumulation of a large number of transport routes end operations, which also deviate irregular. Almost entirely in the stream of a sensor network infrastructure will be forwarded to or from a gateway, and in ad-hoc sensor network or client network traffic flow between any pair of nodes.

Trm Array Antenna

In a wireless communication system, an antenna array, which helps to improve a system The basic components of a given spectral efficiency and system capacity to the maximum. Active antenna arrays can be used in many applications, such as communication satellites, sonar, and for the signal acquisition [6] other mobile communication. The array antenna system installed on the outside for a long time. The TRM antenna is the very unique component of a Wireless System Network. It is mostly used in the Wireless network to advance the throughout and efficiency of the network. The TRM antenna is widely used in satellites, SONAR for getting hold of signals.

Trm Array Antenna Failure

Due to the presence of a large number of array antenna sometimes TRM disaster. When the transmitter / receiver module (TRM) error occurs, the beam arrangement is inaccurate. In these cases, with all the work TRMS best beam pattern resynthesizing, without fail TRM, it is desirable to use the repair or replacement of the TRM. The transmitter / receiver module (TRM) to vary the volume of deprivation beam pattern; that is, the side-lobe level (SLL) will increase.

From such hazards different researchers have turned their efforts to restore the stream. An important fact about the antenna failure, even if the antenna communication system does not work should not stop. This means we need to find an alternative path in the current path is not working, should be dynamic.

Application of TRM Antennas

Below, given are the few applications of TRM antenna:

- Ground based multi-function radar for military use.
- Airborne radar for surveillance (RBE2).
- Space borne SAR and communications for remote sensing.
- It is recently utilized for radio astronomy.

Other applications of satellite communications antenna and use in different areas of use , a golf driving range and orientation of the discoverer, highway safety, tank monitoring, fish, asset tracking devices, a portable defibrillator and EMS notification, thoroughbred and sport Greyhounds monitoring, remote meter reading, drilling down, machine-to-machine communications, weather recorder / balloon, short-range wireless data transmission , ocean buoys, measuring equipment, the Department of Homeland security and the marathon label.

Related Works

Stephen J.Blank 2005, such an antenna array, extracted by the admittance matrix of active and passive elements from the pattern array of data elements in the new method proposed. Optimization matrix formulation enables passive and active components of the location - the incorporation of empirical optimization algorithm admittance. This method is also used linear coupling of approximately (uneven) member function provides location data, and the computing element for impedance scanning. Calculation and experimental results are presented to show the effectiveness of rapid convergence and experience optimized for performance optimization realistic antenna array.

M.A.Panduro 2006, has dealt with the interference reduction capability of non uniform antenna arrays with linear geometry at the base station of a cellular system. The well known method of genetic algorithms is used to determine the optimal non□uniform array geometry between antenna elements in order to provide maximum interference reduction. The performance criterion for interference reduction employed in this paper is the interference suppression coefficient. Simulation results using different numbers of antenna elements for non uniform linear arrays are provided. Simulation results show that the optimization of the array provides better interference reduction capability with respect to the uniform separation case.

Peter J. Bevelacquaand Constantine A.Balanis 2007, It has solved an ideal antenna array geometry measurement for suppressing interference. Optimization problems derived produce for the best solution given the array of environmental disturbances geometry. A specific example is the simulated annealing optimization algorithm, results are presented as an array of different configurations.

T. Panigrahi, A *et.al* 2008, has applied Particle swarm improvement (PSO) methodology to find out a compensation for degraded pattern of a failed antenna array by amplitude only perturbation of few of the un failed elements. The optimization technique finds the optimum amplitude levels of some of the un failed elements in the array, so that the compensated pattern will match with the pattern of the original array, though not perfectly, but up to a satisfactory level. The reason for applying PSO is that it is simple to code and has small computational cost as compared to other soft-computing techniques. The developed formulation is tested for a 16-element linear broadside array.

U. Singh *et al.* 2010 [12] It utilizes a new biogeography optimization (BBO) algorithm to determine the best set of the amplitude of the antenna elements. In addition, they also suggested that, BBO is fast and reliable global search algorithm to optimize the use of geometric shapes and encourage other antennas.

Jung-Hoon Han *et.al* 2011, It has been proposed based on genetic algorithms for use adaptive weighted beam pattern mask distortion calculated beam patterns resynthesizing optimal beam pattern. The proposed calculation allow for enhanced flexibility and speed.

T.S. Jeyali Laseetha, R Sukanesh 2011, has examined the sending of Genetic Algorithm enhancement technique

for synthesis of antenna array radiation pattern in adaptive beam forming.

Jung-Hoon Han, 2012, We have proposed an algorithm based on genetic algorithm adaptive weighted beam pattern mask distorted beam pattern resynthesizing best beam pattern. The algorithm can be improved resynthesis flexibility and accuracy, and speed up calculations. Some also considered algorithm using beam pattern. TRM proposed repair failure compensation algorithm provides the digital beam forming antenna systems for cost-effective and less time-consuming solution.

Singh Gurpreet, Singh Maninder 2014, proposed a method based on PSO when then compared with genetic algorithm for optimized algorithm. In the end finally comparison is made between GA and PSO.

Various Optimization Techniques

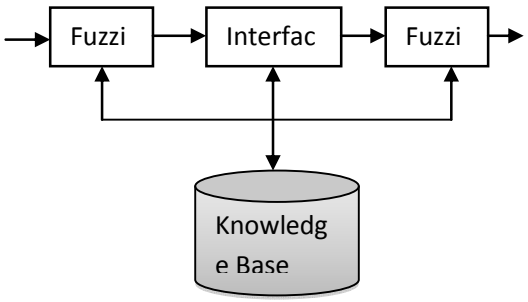
Aco

ACO algorithm is an original intellectual optimization algorithm imply the winged animal swarm practices, which was planned by analyst Kennedy and Dr. Beernaert in 1995. In ACO answer, every individual is called "Burrowing little creature COLONY", which speaks to a potential arrangement. The calculation attains to the best arrangement with the variability of a few particles in the following space. An ANT COLONYs seek in the arrangement space captivating after the best ANT COLONY by altering their positions and the wellness oftentimes, the airborne course and speed are controlled by the object function.

Assuming Xi= (xi1,xi2,…xiD) the point of i-th ANT COLONY in d-dimension, V_i= (vi_1,vi_2,….,vi_D) is its velocity which characterize its bearing of searching. In iteration process, each ANT COLONY keep the best location p best establish by it, as well, it also knows the best position best search by the collection ANT COLONYs, and changes its velocity according two best positions.

Fuzzy Logic

Principle of fuzzy logic to achieve variable in the sense that humans, treatment is not binary high contrast of human language, the language of many variables have relatives, but more clearly, very textured, very uniform and so on. In addition, these variables are language rules and deal with some of the reference system of knowledge. Fuzzy and fuzzy fuzzy number, and vice versa conversion effect of external information.



FIS as in figure consists of four function blocks. They are

1. fuzzy: it transmits crisp input fuzzy sets.
2. Knowledge: it mainly consists of a database and rule base. It defines the membership functions of linguistic variables of a data base. Libraries can also provide rules or rules that can be extracted from the data description language by a set of IF-THEN by a human expert.
3. The inference engine: it is the use of fuzzy rules, the general control mechanism in order to achieve a certain conclusion fuzzy knowledge base as defined in the collection.
4. defuzzification: it is transferred to the fuzzy set clear output.

CONCLUSION

TRM antenna is the one of the component of the Wireless System Network. It is used in Wireless network to improve the throughout and efficiency of the network. The TRM antenna is used in satellites, SONAR for acquisition of signals. Due to large number of arrays presents, sometimes TRM antenna failure takes place. When the transmitter / receiver module (TRM) error occurs, the beam pattern distortion. In this case, all the features of the resynthesis TRMS the optimal beam pattern, without fail TRM, preferably TRM repair or replace a transmitter / receiver module (TRM) capacity degradation distorted beam pattern; i.e., next lobe level (SLL) increases. From such hazards different researchers have turned their efforts to recover this stream. A key fact about the antenna failure, even if the antenna communication systems are not working properly should not stop in. That means we need to find an alternative path if the current path is not working and should be dynamic