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RESEARCH ARTICLE

Ongole Breed Cattle Health Expert Advisory System Using Parallel Particle Swarm Optimization Algorithm

B. Jogeswara Rao, Prof. M. S. Prasad Babu
Research Scholar, Dept. of CS & SE, Andhra University, Visakhapatnam, India
Professor, Dept. of CS & SE, Andhra University, Visakhapatnam, India

Abstract— the present developed paper deals with the development of expert systems using machine learning algorithm techniques to advice the farmers through online in villages. An expert system can be defined as a computer program, with a set of rules encapsulating knowledge about a particular problem domain. Machine Learning is a mechanism, used in the development of Expert systems, concerned with writing a computer program that automatically improves with experience. PSO Algorithm was taken as base and designed a new algorithm known as Parallel Particle swarm optimization. Using this Parallel Particle swarm optimization (PSO). We developed a Ongole Breed Cattle Expert System. This system is mainly aimed for identifying the diseases and disease management Of Ongole Breed Cattle and to advise the farmers through online in the villages. The present advisory system is designed by using JSP as front end and MYSQL as backend.

Key words: Expert Systems; Machine Learning; PSO Algorithm; Parallel PSO; Optimization; Ongole Breed Cattle; JSP & MYSQL

I. INTRODUCTION

A. Expert ***Systems:***

Expert systems can be defined as computer systems that incorporate the knowledge of human experts to assist decision making processes. Expert Systems perform tasks for which specially trained or talented people required. Typically, such an expert system contains a knowledge base containing accumulated experience and a set of rules for applying the knowledge base to each particular situation that is described to the program. Sophisticated expert systems can be enhanced with additions to the knowledge base or to the set of rules. A wide variety of methods can be used to study the performance of an expert system. The sequence of steps followed to reach a conclusion is dynamically synthesized with each new case. The key idea in expert systems technology is that it is not explicitly programmed when the system is built and problem solving is accomplished by applying specific knowledge rather than specific technique to the developing system.

B. Ongole Breed Cattle:

The Ongole are large-sized animals with loosely knit frames, large dewlaps which are fleshy and hang in folds extending to the navel flap, and slightly pendulous sheaths. They have long bodies and short necks; limbs are long and muscular. The forehead is broad between the eyes and slightly prominent. Eyes are elliptical in shape with black eyelashes and a ring of black skin about 1/4 to 1/2 inch wide around the eyes. Ears are moderately long, measuring on an average for 9 to 12 inches, and slightly drooping. Horns are short and stumpy, growing outwards and backwards, thick at the base and firm without cracks. In some animals the horns are loose; this is probably due to the horn core not growing well. The hump in the males is well-developed and erect and filled up on both sides and not concave. The skin is of medium thickness, mellow and elastic and often shows black mottled markings. The popular color is white. The male has dark gray markings on the head, neck and hump and sometimes black points on the knees and on the pasterns of both the fore and hind legs. A red or red and white animal of typical conformation is occasionally seen. They have a white switch of the tail, white eyelashes, a flesh colored muzzle, light colored hooves, dark gray marking on the hindquarters and dark mottle appearance on the body. Ongole cattle are efficiently used in their native home for both work and milk production. They are usually docile and the bulls are very powerful, suitable for heavy plowing or car work but are not considered to be suitable for fast work or trotting purposes. Farmers in the breed tract has selected and preserved each successive variation, with the distinct intention of improving and altering a breed, in accordance with a preconceived idea, and by thus adding up variations, often so slight as to be imperceptible to the uneducated. He has effected wonderful changes and improvements in the direction he desired as we see here under in Ongole Breed from 1880. There is a tendency in the breed to grow leggy with sparse light carriage, but their form, temper and endurance earned nearness to the breeders.

C. Machine Learning:

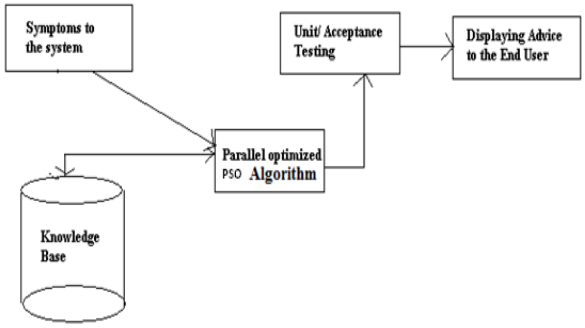
Machine Learning is a scientific discipline, which is concerned with the design and development of computer programs that automatically improves with experience. It is a very young scientific discipline whose birth can be placed in the mid-seventies. Machine learning usually refers to the changes in systems that perform tasks associated with artificial intelligence (AI). Such tasks involve recognition, diagnosis, planning, robot control, prediction, etc. The changes might be either enhancements to already performing systems or synthesis of new systems.

D.PSO Algorithm:

Particle swarm optimization (PSO) is a population based stochastic optimization technique developed by Dr. Eberhart and Dr. Kennedy in 1995, inspired by social behavior of bird flocking or fish schooling. PSO shares many similarities with evolutionary computation techniques such as Genetic Algorithms (GA). The system is initialized with a population of random solutions and searches for optima by updating generations. However, unlike GA, PSO has no evolution operators such as crossover and mutation. In PSO, the potential solutions, called particles, fly through the problem space by following the current optimum particles. Each particle keeps track of its coordinates in the problem space which are associated with the best solution (fitness) it has achieved so far. (The fitness value is also stored.) This value is called *pbest*. Another "best" value that is tracked by the particle swarm optimizer is the best value, obtained so far by any particle in the neighbors of the particle. This location is called *lbest*. When a particle takes all the population as its topological neighbors, the best value is a global best and is called *gbest*. The particle swarm optimization concept consists of, at each time step, changing the velocity of (accelerating) each particle toward its p*best* and *lbest* locations (local version of PSO). Acceleration is weighted by a random term, with separate random numbers being generated for acceleration toward *pbest* and *lbest* locations. In past several years, PSO has been successfully applied in many research and application areas. It is demonstrated that PSO gets better results in a faster.

E. Proposed System:

A Web Application of Expert Advisory System for **Ongole Breed Cattle** is developed by using **PSO** Algorithm as base and modified this PSO Algorithm as parallel Artificial Bee Colony Optimization Algorithm. The proposed Architecture is as follows:



F. Proposed Algorithm:

In general, parallel architectures may use either a shared memory or a message passing mechanism to communicate in between the multiple processing elements. Parallel metaheuristic algorithms have been developed for both these kinds of architectures. A parallel implementation of the algorithm is designed for an optimized architecture, which overcomes these dependencies. The entire colony of bees is divided equally among the available processors. Each processor has a set of solutions in a local memory. A copy of each solution is also maintained in a global shared memory. During each cycle the set of bees at a processor improves the solutions in the local memory. The output optimization can be taken as the total number of symptoms matching divided by the total number of symptoms in the system. At the end of the cycle, the solutions are copied into the corresponding slots in the shared memory by overwriting the previous copies. The solutions are thus made available to all the processors.

Step.1. Generate SN initial solutions randomly and evaluate them. Place them in the shared memory S.
Step.2. Divide the solutions equally among p processors by copying SNp solutions to the local memory of each processor.
Step.3. Steps 4 to 10 are carried out in parallel at each processor Pr.
Step.4. For each solution in the local memory Mr of the range processor Pr, determine a neighbor.
Step.5. Calculate the optimization for the solutions in Mr.
Step.6. Place the onlookers on the food sources in Mr and improve the corresponding solutions (as in step 4).
Step.7. Determine the abandoned solution (if any) in Mr and replace it with a new randomly produced solution.
Step.8. Record the best local solution obtained till now at Pr.
Step.9. Copy the solutions in Mr to the corresponding slots in S.
Step.10. Determine the global best solution among the best local solutions recorded at each processor.

G.Database Generation:

In this section, the setup for production rules in the knowledge base is presented. Generally, the rules are of the form,

Rule 1: S1=1,S2= 0,S3= 0,S4= 0, S5=0,S6= 1,S7= 0,S8=1, S9= 0,S10= 0,S11= 0,S12= 0
Resultant disease may be D1

Rule 2: S1= 1,S2=1 ,S3= 0 ,S4= 0, S5= 0,S6= 0 ,S7=1,S8= 0 ,S9= 0 ,S10= 0 ,S11=0,S12= 1Resultant disease may be D3

Rule 3: S1= 0,S2= 1 ,S3= 0 ,S4= 0 , S5= 1,S6= 1 ,S7= 0,S8= 0 ,S9= 0 ,S10=1 ,S11=0 ,S12= 0 Resultant disease may be D5.

TABLE.1 DATABASE FORMAT

Disease	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	S13	**Cure**
D1	1	1	0	0	0	0	0	0	0	0	0	0	0	C1
D2	0	0	1	0	1	1	0	0	0	0	0	0	0	C2
D3	0	0	0	1	0	0	1	1	0	0	0	0	0	C3
D4	0	0	1	0	0	0	1	1	0	0	1	0	0	C4
D5	0	0	0	0	0	0	0	0	1	1	0	1	0	C5
D6	0	0	0	0	0	0	0	0	0	0	1	1	1	C6

II. **TEST RESULTS**

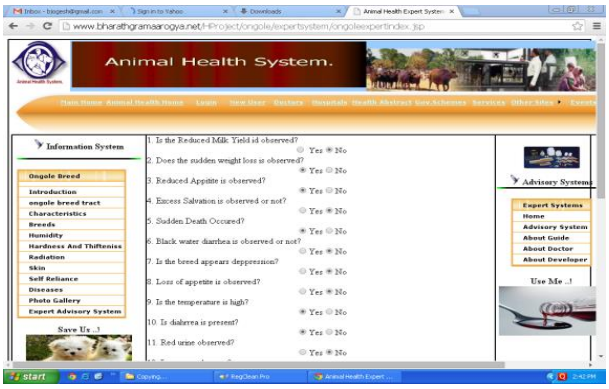


Fig:1. Selection of Symptoms

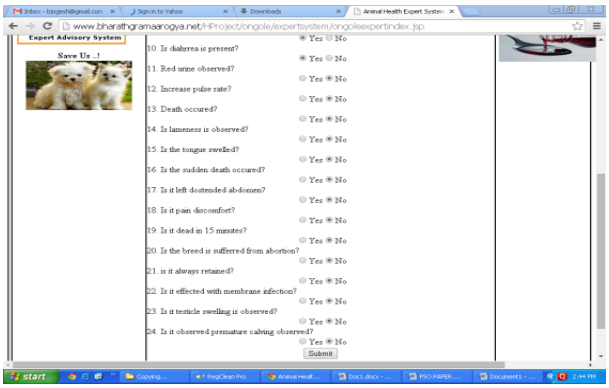


Fig:2. Selection of Symptoms

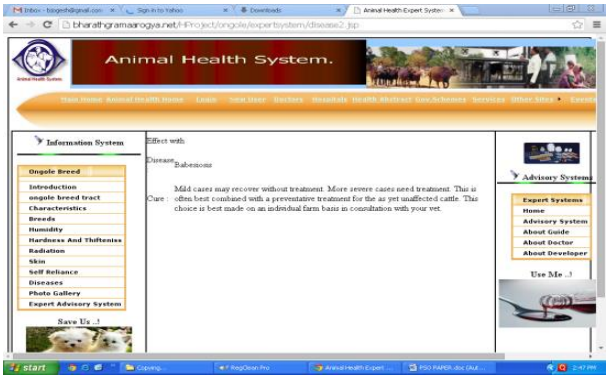


Fig: 3. displaying advice to the end user

III. **CONCLUSIONS**

In the proposed system, A Parallel Implementation of Optimized Particle swarm optimization (PSO) Algorithm was developed which gives better results compared to implementation of general PSO Algorithm. In the present investigation it was found that, the Parallel Optimized PSO gives a better optimization compared with general PSO Algorithm. The algorithm used in the present system can be treated as quite effective; in most of the cases it finds a solution which represents a good approximation to the optimal one. Its main emphasis is to have a well designed interface for giving Ongole Breed Cattle Health related advices and suggestions sin the area to farmers by providing facilities like online interaction between expert system and the user without the need of expert all times. By the thorough interaction with the users and beneficiaries the functionality of the System can be extended further to many more areas in and around the world.

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REFERENCES

[1] Kennedy, J. and Eberhart, R. C. Particle swarm optimization. Proc. IEEE int'l conf. on neural networks Vol. IV, pp. 1942-1948. IEEE service center, Piscataway,NJ,1995.
[2] Eberhart, R. C. and Kennedy, J. A new optimizer using particle swarm theory. Proceedings of the sixth international symposium on micro machine and human science pp. 39-43. IEEE service center, Piscataway, NJ, Nagoya, Japan.1995
[3] Eberhart, R. C. and Shi, Y. Particle swarm optimization: developments, applications and resources. Proc. congress on evolutionary computation 2001 IEEE service center, Piscataway, NJ., Seoul, Korea., 2001.
[4] Eberhart, R. C. and Shi, Y. Comparison between genetic algorithms and particle swarm optimization. Evolutionary programming vii: proc. 7th ann. conf. on evolutionary conf., Springer-Verlag, Berlin, San Diego, CA., 1998.
[5] Shi, Y. and Eberhart, R. C. Parameter selection in particle swarm optimization. Evolutionary Programming VII: Proc. EP 98 pp. 591-600. Springer-Verlag, New York, 1998.
[6] Shi, Y. and Eberhart, R. C. A modified particle swarm optimizer. Proceedings of the IEEE International Conference on Evolutionary Computation pp. 69-73. IEEE Press,Piscataway,NJ,1998.
[7] Holland, J. H. (1992). Adaptation in Natural and Artificial Systems. MIT Press, Cambridge, MA.
[8] Millonas, M. M. (1994). Swarms, phase transitions, and collective intelligence. In C. G. Langton, Ed., Artificial Life III. Addison Wesley, Reading, MA.
[9] Reeves, W. T. (1983). Particle systems - a technique for modeling a class of fuzzy objects. ACM Transactions on Graphics, 2(2):91-108.
[10] Reynolds, C. W. (1987). Flocks, herds and schools: a distributed behavioral model. Computer Graphics, 21(4):25-34.
[11] Andhra's Ongole bulls are prized as they are said to be resistant to mad cow disease - source Outlook India
[12] Breeds of Livestock, Reference: Joshi, N.R., Phillips, R.W. (1953) Zebu Cattle of India and Pakistan, FAO Agriculture Studies No. 19, Publ. By FAO, Rome, 256 pp
[13] A STUDY ON COAT COLOUR IN ONGOLE CALVES* R. Vinoo, G. Narasimha Rao1, B. Ramesh Gupta2 and K. Babu Rao, Cattle Project, Lam Farm, Guntur - 522 034, India

