Neuron Model to Analyze the Infection behavior in sample food material

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Abstract: ***Food safety is a global health goal and the food infection take a major crisis on human health. So Food safety and food security continued to draw the attention of consumers, food manufactures and producers. The quality of food material must be maintained.***

This paper is presents the neuron system which is used to study the impurity in food material. The impurity is studied on the basis of behavioral parameters such as trajectories, generation and regeneration of infection depending on the population of infection. This system is developed a model which is used to analyze the food material on the basis of behavior of the material.

The proposed research designs a three layer neuron model using supervised learning technique.

The result of this researche is used to study the food material and predict the different parameters of testing material. This model is used to compare and analyze different dose response model with neurons model.

Keywords: Food infection, contamination, performance

I. Introduction

This model has considered the discrete nature of impurities and should be based on the concept of infection which varies in population with respect to initial stage [1]. The rapid detection and identification of infection in food material is a preliminary issue in fields of monitoring of food-safety.

As Food infection is a growing cause for human illness and death. There is continually increasing demands to maintain the safe food supply. A rapid method is needed that can understand the food level either it is consumable or not.

Current food diagnostic technologies [3] require both outgrowth and capture of the infections in the detection protocols. This step requires hours to days, and may fail to detect [5].

The potential and the quality of food is essential component for the survival of living beings on earth. As The infection of food increases depending on the number of parameters such as life of food, the atmospheric condition of the food, ingredients used in the manufacturing processing of food, and most important is the actual initial condition of the food.

In this research, the known food sample is used as initial dose to the system. The performance and behavioral parameters is varied under the testing condition.

The model system is designed to detect the impurity, analyze the behavior of infection with respect to time of food material.

The output of electronics system is the actual input of the first stage of this model. The other performance parameters like temperature, pressure and humidity acts as a threshold

parameters .The calculated response is used to train the neurons.

The behavioral response of impurities in material is plotted.

II. Basic Neuron System

The neural network model is configured so that this model is used to set the desired expected output by varying the input relation.

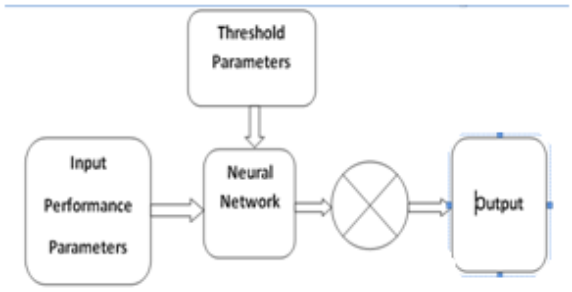

fig1: The neural computational system

This network is designed by using three layers. The node of the input layer is depending on the performance parameters. The data is feed forward to the input is the output of the electronics system which is used to compute the condition of the input sample food. The network is trained using the supervised learning method.

III. Modeling Concept

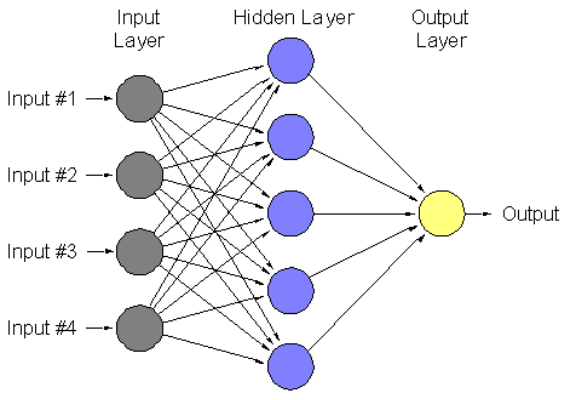

fig 2: Computational neural system

In this research, the performance parameters are varied under the testing condition. The various sample of food can be tested. The infection in material varies with respect to time, temperature, the moisture present in the food. The model is configured and trained using known parameters. The input sample is tested and it is compared with the impurity contaminated food. These parameters must be maintained in the required range of respective food.

The proposed system is trained to analyze the behavior of infection in food sample. The hidden layer stored the various iteration data. Each unit of the system performs the individual function. The node of the system either accepts the data from the neighbor node or either from the external source. Each unit inherently works together so that the resultant trajectories of the infection can be obtained.

The output neuron is used to represent the probability of infection, while the inputs neurons are used for ingested dose response of the neural network.

IV. Result

The contamination in the sample is tested by varying the performance parameters.

The neuron is trained by using supervised learning technique to get the iteration wise result.

The primary stage of infection is plotted in fig3.

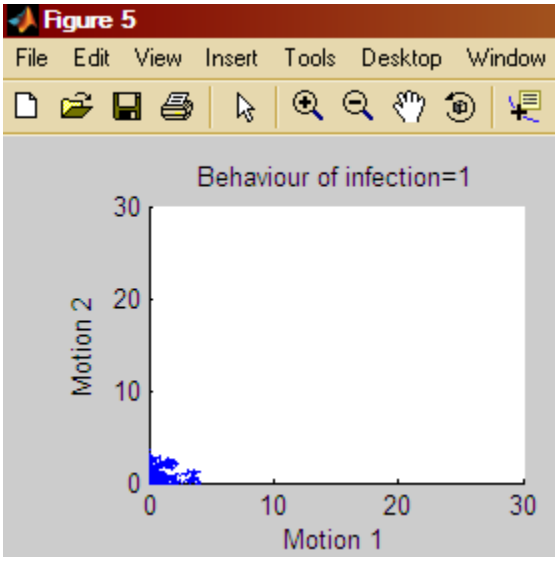

fig 3:Behaviour of infection(iteration 1)

On the basis of dose response relationship ,the next generation and regeneration of infection ,increase the infection contamination in testing material is compared using fig 4,fig 5.

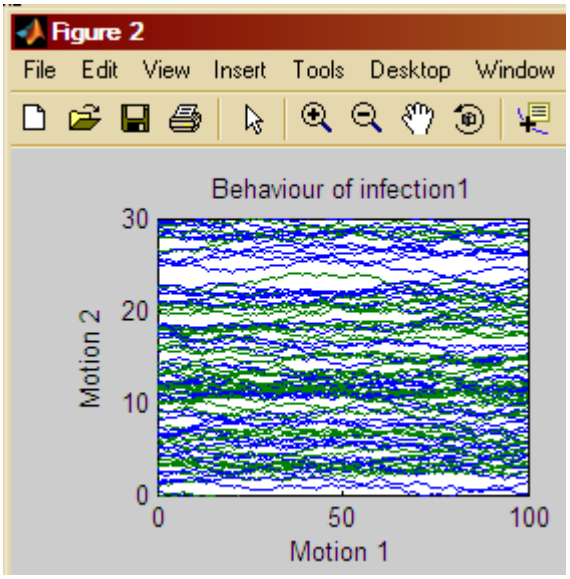

fig 4:Behaviour of infection(iteration 2)

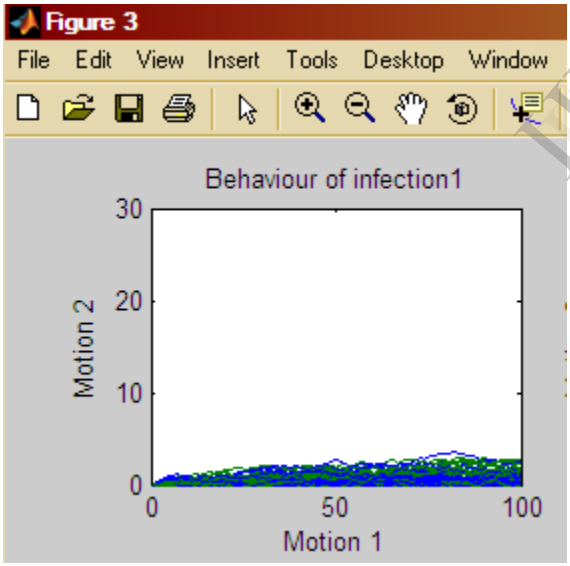

fig 5:Behaviour of infection(iteration 3)

As the infection varies with respect to performance parameters, the result of this increase/decrease is used to plot in fig 6.

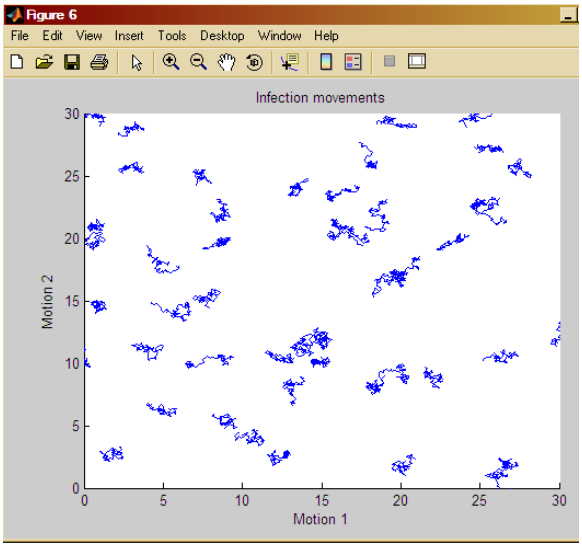

fig 6:Infection moment

V. Conclusion

The implementation of neural network model on the parallel computation basis required many aspects to get predicted solution. The predictions using neural networks are better for the tested samples. It can also tested for various dose–responses for more than one type of infection in a sample.

VI. References

[1] W. Bourgeoisis, A.C. Roman, J. Nicolas and R. M. Stutez, The use of sensor arrays for environmental monitoring: interests and limitation. Environmental Monitoring, 2003.

[2] T. Rajamakii, H. L. Alakomi, T. Ritvanen, E. Skytta, M. Smolander and R. Ahvenainen, Application of an E-nose for quality assessment of modified atmosphere packaged poultry meat, Food Control 17, 5-13, 2006.

[3] M. E. Shykhon, D.W. Morgan, R. Dutta, E.L. Hines and J.W. Gardner, Clinical evaluation of the electronic nose in the diagnosis of ear, nose and throat infection: a preliminary study. J. Laryngol. Otol. 118, 706-709, 2004.

[4] N. A. Lacher, N. F. de Rooij, E. Verpoorte, and S. M. Lunte, "Comparison of the performance characteristics of poly (dimethylsiloxane) and Pyrex microchip electrophoresis devices for peptide separations," *J. Chromatogr. A*, vol. 1004, pp. 225–235, 2003.

[5] Liu, Z., Wolff, M.S., Moline, J., 2005. J.Chromatography B, 819,155-159.

[6] C. Estes, A. Duncan, B. Wade, C. Lloyd, W. Ellis Jr., and L.Powers, "Reagentless detection of microorganizms

by intrinsicfluorescence," *Biosensors Bioelectr.*, vol. 18, p. 511, 2003.

[7] P. S. Mead, L. Slutsker,V. Dietz, L. McCaig, J. Bresee, G. P. Shapiro, and R. Tauxe, "Food-related illness and death in the united states," *Emerging Infect. Diseases*, vol. 5, 1999.

[8] Anzai, Y.; Saito, S.; Fujimoto, K.; Kinoshita, K.; Kato, F. Detection and Identification of Species with Bacterial Cells Using a Plastic DNA Array. *J. Health Sci.* **2008**, *54*, 229-234.

[9] WHO, Food Safety & Food-borne Illness. Fact Sheet No. 237 (Reviewed March 2007), 2007. World Health Organization,Geneva.

[10] Early detection of fungal growth in bakery products by use of an electronic nose based on mass spectrometry. *J. Agric. Food Chem*. **2004**, *52*, 6068-6074.

[11] Keshri, G.; Magan, N.; Voysey, P. Use of an electronic nose for the early detection and differentiation between spoilage fungi. *Lett. Appl. Microbiol*. **1998**, *27*, 261-264.

[12] Elvira Beli, Esat Duraku, Altin Telo, "*Salmonella* serotypes isolated from chicken meat in Albania," International Journal of Food Microbiology, vol. 71, pp. 263-266, June 2001.

[]3] Blixt, Y.; Borch, E. Using an electronic nose for determining the spoilage of vacuum packaged beef. *Int. J. Food Microbiol*. **1999**, *46*, 123-134.

[14] Liu R, Tang W, Kang Y, Si M (2009) Studies on best dose of X-ray for Hep-2 cells by using FTIR, UV-vis absorption spectroscopy and flow cytometry. Spectrochim Acta A Mol Biomol Spectrosc 73: 601-607.