Applied Science and Technology Research Journal Volume 3 Number 1, May 20224
e- ISSN : 2963-6698
https://journal.upy.ac.id/index.php/ASTRO/index

Determination Of Freshwater Consumption Fish Diseases Using Artificial Neural Network Methods

Bagas Apriyanto[1], Ahmad Riyadi[1], Ari Kusuma Wardana[1*], Mohd Nasrun Mohd Nawi[2]
[1]Informatics PGRI University Yogyakarta Indonesia
[2]Universiti Utara Malaysia, Malaysia
E-mail: [1]bagasapriy@gmail.com , [1]ahmadriyadi@ upy.ac.id , **[*1]ari@upy.ac.id,**
[2]mohdnasrun@gmail.com

Abstract

Artificial Neural Network (ANN) is a branch of Artificial Intelligence (AI) that uses neuron-based computational methods to identify and solve problems. In this study, we tried to use ANN to identify diseases of freshwater fish commonly consumed by the public, using one of the ANN methods, namely backpropagation. This research produces a website-based system that uses the backpropagation Neural Network method so that it can be used to help freshwater fish breeders or cultivators identify fish diseases that are kept more accurately than conventional methods. In addition, it is hoped that this system can anticipate more severe infections in fish belonging to cultivators. The results of system testing show that regarding the appearance of the system, 38.5% of respondents answered that the design was beautiful, related to the ease of use of the system, 46.2% of respondents answered that the approach was straightforward to use, regarding the performance of the system 53.8% of respondents answered that the system performance was excellent. Regarding the system's benefits, 76.9% of respondents answered that the system was beneficial. .

Keywords: *Artificial Neural Network, Fish Disease, Backpropagation*

1. INTRODUCTION

Disease is problem main in freshwater fish cultivation [1] . Usually fish disease appears Because caused by the weak condition of the fish Because caused by various factor like factor food , fish handling as well condition an environment that doesn't support . Easy fish caught disease , usually because the fish suffer stess [2] .

Appearance attack disease including one no appropriate in interactions that occur under conditions environment as well as the organism that gives rise to it exists disease . So that Can understood If No harmonious interaction the Can cause exists stress experienced by fish [3] . Diseases found in fish can categorized as to in two matter ie endoparasite as well as ectoparasites . Second matter the have characteristic harm For development as well as fish growth . Therefore attack disease Can is known from something type parasites found in fish [4] .

Fish farmers or most fish farmers Still inspect fish disease manually or conventional . The breeder's way or fish farmers who are still spelled out ancient This very No effective , because if identification not enough accurate and also if misidentified fish disease , then consequences No appropriate handling it . This matter Of course will caused harm fish farmer .

Progress field informatics specifically network nerves imitation can help farmers or freshwater fish cultivators in identify diseases of farmed fish more accurate instead of with manual method [5] . Network Nerves Imitation Already experience development with fast and done used in various ways applications found in a number of field technology as well as

knowledge knowledge , esp in field animal husbandry , network nerves imitation can help breeder in identify disease animal livestock [3] .

Based on background behind the so researcher make A system website- based that can be used For identify and provide solution For common diseases of freshwater fish consumed by the public with use *backpropagation* ANN method . With system created This expected fish farmers can quick identify and prevent fish from being affected more disease serious , so fish farmers do not experience Lots losses and fish sold is a quality fish .

2. LITERATURE REVIEW

2.1 Network Nerves Imitation

One of intelligence artificial that uses technology computer is Network Nerves Imitation [6] . ANN processes and processes information like similar characteristics network nerves biology man [7] . Network nerve artificial (*Artificial Neural Network*) is something functioning system For processing information or designed data with copy method Work from brain man For finish something problem with carry out the learning process through change in weight synapse . Network This Can operate introduction activity data- based or past information [8] . Network nerves artificial (*Artificial Nural Network*) is something network For modeling method Work system nerves human (brain) in carry out task certain [3] .

2.2 Backpropagation

Backpropagation included something method used in ANN as well as the usual one used in a number of ways field application for example forecasting , recognition pattern as well as optimization . That matter possible because method This use nature of learning guided [9] .

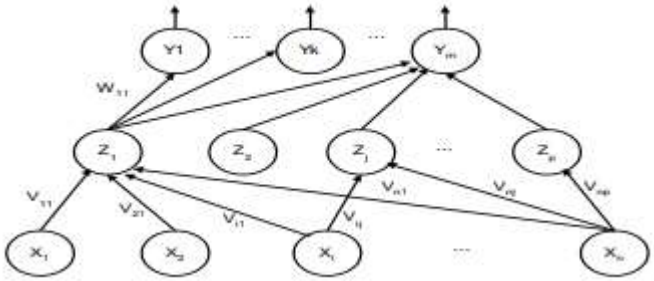

Figure 1. Network Nerves Imitation

2.3 Backpropagation Architecture

In the network nerves imitating backpropagation, the various units contained in the input layer will connected with various units contained in the layers hidden . The same thing applies in system coating hidden . Where each unit is located in layer hidden the connected with various units contained in the output layer [10] .

2.4 PHP

PHP is Language open source server-side web programming , PHP includes scripts that have integration with html as well is in the server section . PHP includes the script used in form dynamic website pages . Dynamic This meaningful If displayed page made when page the requested by the party client [11] .

2.5 Freshwater fish

Freshwater fish is a fish that spends all over or even part of it lives in fresh water for example at the wrong lake earlier river that has salinity < 0.05%. In various matter freshwater environment No The same with environment in sea water and what differentiates it the most is level salinity . In order to live in fresh water then the fish need it adaptation physiology that has objective For guard balance concentration of ions in the body . According to existing data as much as 41% of all fish species exist in fresh water . That matter caused rapid speciation that causes habitats to scatter possible For lived in .

2.6 Diseases of Fish Consuming Fresh Water

Fish deaths due to attack from a number of disease as well as decreasing quality environment , up to Now This become something complex problems as well as Serious . One of the thing that causes it exists death is Because extreme weather in Indonesia and accompanied by with there is rain intensity tall . Circumstances That push exists a number of developing diseases in fish [12] . Following a number of Diseases in freshwater consumption fish :

1. Multifillis
2. Multifillis Rescue
3. Trichodina
4. Childonella Hexastica
5. Yellow Mushroom

3. RESEARCH METHODS

In study this , method planning system used is *waterfall* included something methods contained in the SDLC system or system *development life cycle* . SDLC has characteristic special that is workmanship in each phase in *the waterfall* , mandatory done solution moreover first , then new Can continue to in phase next . *Waterfall* method is processing from A running system linearly or sequentially . Can be understood If *waterfall* own various step like following ie analysis , writing , design , testing as well as implementation and maintenance [14] .

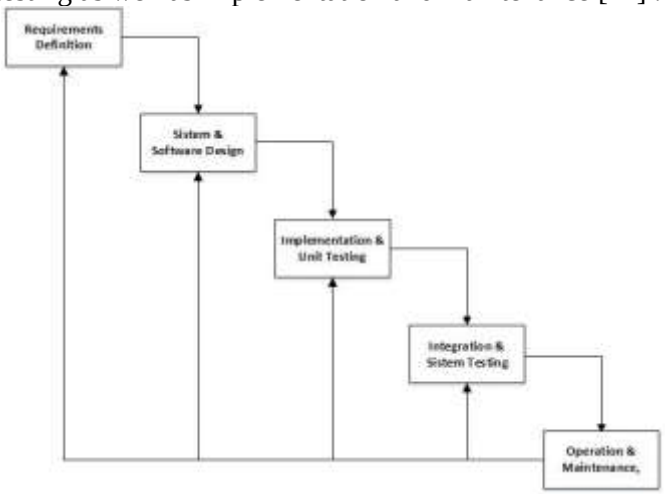

Figure 2. Waterfall method

4. SYSTEM PLANNING

Design system used to give ease of implementation process. Basically design system built covers analysis need system , design system in a way detailed as well as general , implementation system as well as testing system [15] .

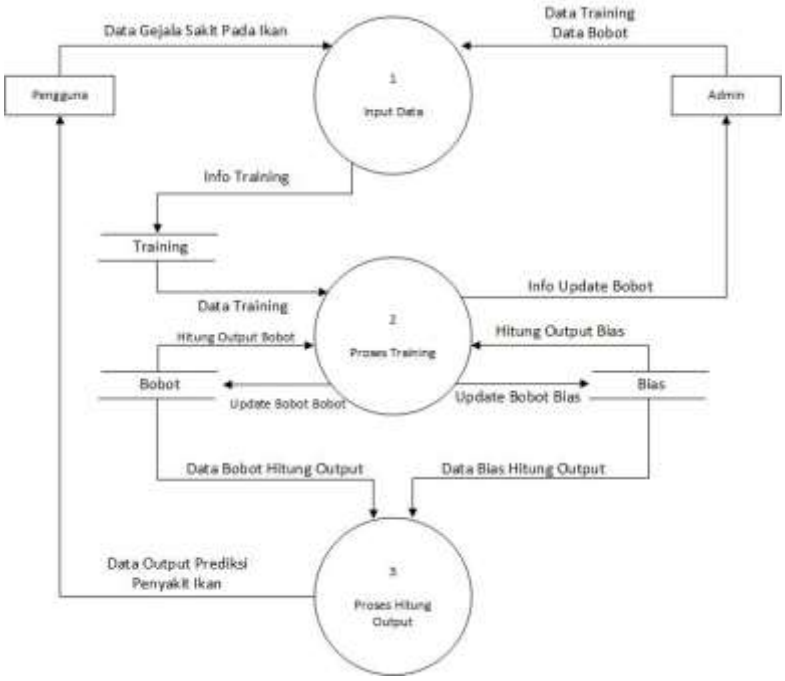

Figure 3. DFD Level 1

4.1. Backpropagation Calculation

4.1.1.Analysis Data Training

Analysis data training is performed For test how much big accuracy system training against training data . Parameters for training will differentiated For compared and tested accuracy system .

- Training data used as many as 50 data.
- Tolerance error will be set differently , with range of 0.007 to with 0.001.
- Iteration maximum as many as 10000.
- Alpha value 0.6.

Table 1. Training Test Table

No.	Tolerance error	Max. Iteration	Alpha	A sum of Squared Errors	Iteration Stop	Practice Trial
1.	0.007	15000	0.1	0.00697352277	10955	2
2.	0.006	15000	0.1	0.00599921276	9549	1
3.	0.005	15000	0.1	0.00498992102	11548	3
4.	0.004	15000	0.1	0.00399995963	8967	2
5.	0.003	15000	0.1	0.00298979922	12659	4
6.	0.002	15000	0.1	0.00199729911	10482	5
7.	0.001	15000	0.1	0.00098893412	9957	5

4.1.2.Analysis Data Testing

Data testing will done with using existing test data determined as many as 50 data. Table 2 is the data that will be tested.

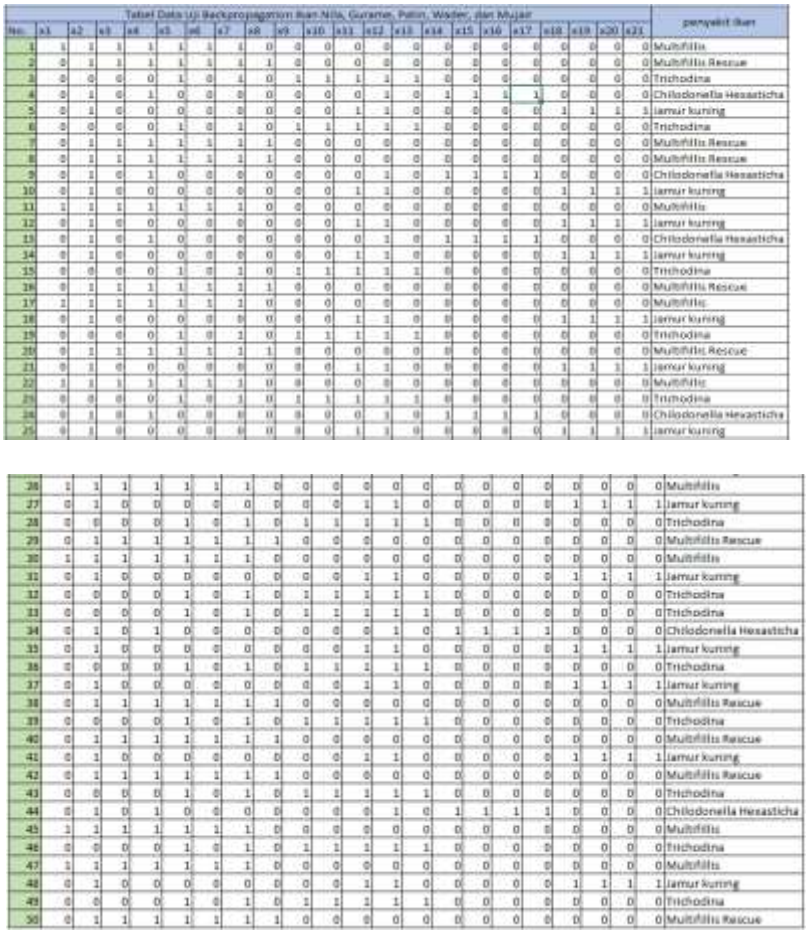

Figure 2. Test Data Table Simulation

5. RESULTS AND DISCUSSION

5.1. Implementation System

Implementation and testing system including procedures carried out in do solution design system based on with analysis and design system that has made. By general objective from stage This is To use run tests on existing systems created, what is the system output Already in accordance with hope as well as desired goal.

5.1.1.Appearance Aawal

On the page beginning there is information regarding fish, there is a login menu that can be accessed by the admin, to user besides admin can identify fish disease, in the initial menu This .

Figure 4. Initial View

5.1.2.Login View

In the login page, admin is prompted enter right have access to do so enter to the main menu .

Figure 5. Login View

5.1.3.Main Page Display

main page of the admin menu consists of from some menus only can accessed by the admin.

Figure 6. Main Page Display

5.1.4.Identification Page View Disease

On this page user besides admin can choose symptoms found in the body of fish consumed in fresh water, after choose symptom the so system will identify fish disease.

Figure 7. Identification Page View Disease

5.1.5.Alpha Testing

Alpha testing is performed with 13 people respondents For operate system Determination Diseases of Fish Consuming Fresh Water By Network Method Nerves Imitation . Respondent run the program and deliver response . Table 3 is results testing from the existing system made.

Table 3. Alpha Test Results

No.	Testing	Very interesting	Interesting	Not attractive
1	Appearance Application	38.5%	46.2% .	15.4%
2	Convenience Application	46.2%	53.8%	0%
3	Application Benefits	76.9%	23.1%	0%
4	Application Performance	53.8%	46.2%	0%

6. CONCLUSIONS AND RECOMMENDATIONS

In accordance with results implementation System Determination Diseases of Fish Consuming Fresh Water Using Network Methods Nerves Imitation , researcher can conclude that system can predict disease in fish more accurate compared to with conventional way . Besides that system Already can walk with Good . Suggestions for study furthermore is on research furthermore expected system capable identify all freshwater fish disease , and not limited only in ordinary freshwater fish consumed by the public .

BIBLIOGRAPHY

[1] HP Fidyandini, "TRAINNING ON THE USE OF PROBIOTICS AND IMMUNOSTIMULANTS FOR THE PREVENTION AND TREATMENT OF CATFISH DISEASES IN THE ULAM ADI JAYA FISH FARMERS GROUP, MESUJI DISTRICT," *Sakai Sambayan J. Pengabdi. To. Masy.* , vol. 5, no. 2, p. 116, Jul. 2021.

[2] C. Purbomartono, Y. Aditya, DS Mulia, JR Wuliandari, and A. Husin, "Non-Specific Immune Response of Goldfish (Cyprinus carpio L.) Given β-Glucan Through Dietary Feed," *Sainteks* , vol. 17, no. 2, p. 115, Feb. 2021.

[3] T. Hastono, "Design of an Application for Predicting Customers' Durian Fruit Needs Using Neural Networks," pp. 200–205.

[4] R. Mastuti, "TREATMENT OF MAS DISEASE (Motile Aeromonas Septicaemia) WITH MANGROVE LEAF EXTRACT (Rhizophora sp.) ON SIAM JAMBAL FISH (Pangasius hypophthalmu," 2017.

[5] SS Priyo, AW Helmie, W. Indra, B. Nurdin, and TW K, "Chapter 7 Backpropagation and its Applications," pp. 135–146, 2016.

[6] R. Maiyuriska, "Application of Artificial Neural Networks with Backpropagation Algorithms in Predicting Rice Grain Harvest Results," *J. Inform. Econ. Business* , pp. 28–33, March. 2022.

[7] F. Rohman, "Electricity Load Prediction Using an Artificial Neural Network Backpropagation Method," *J. SURYA ENERGY* , vol. 5, no. 2, March. 2022.

[8] P. Jambi, "ARTIAL NEURAL NETWORKS FOR IDENTIFICATION USING THE BACKPROPAGATION ALGORITHM (CASE STUDY IN THE MARINE AND FISHERIES SERVICE," vol. 1, no. Senatekom, pp. 300–306, 2015.

[9] N. Nurmila and A. Sugiharto, "Back propagation neural network algorithm for character pattern recognition in Javanese letters," vol. 1, pp. 1–10, 2005.

[10] RS Suhartanto, C. Dewi, and L. Muflikhah, "Implementation of Backpropagation Neural Networks for Diagnosing Skin Diseases in Children," vol. 1, no. 7, pp. 555–562, 2017.

[11] Elisa, "One of the programming languages that makes it possible to support online schedule viewing is PHP (PHP Hypertext Preprocessor), where PHP is a web-based programming language that has the ability to process dynamic data. . jQu," vol. 4, no. November, 2012.
[12] M. Parna and P. Sianggaran, "APPLICATION OF THE LEARNING VECTOR QUANTIZATION (LVQ) METHOD FOR DIAGNOSIS OF PUMPKIN FISH DISEASE (Case Study: BATAM MARINE CULTURE CULTIVATION CENTER)."
[13] AP Data, "Comparison of the C45 Algorithm, Naïve Bayes and K-Nearest Neighbor in Patients Affected by Diabetes," pp. 161–162.
[14] KS Handayani, DK Lumbanbatu, and M. Kom, "STUDENT COMPETENCY TEST VALUE (CASE STUDY OF JABAL RAHMAH STABAT VOCATIONAL SCHOOL)," vol. 14, no. 1, pp. 73–80, 2021.
[15] C. Management, "CONTENT-BASED MARKETPLACE DESIGN OF UPY STUDENT ENTREPRENEURSHIP PRODUCTS," vol. 7, no. 1, pp. 73–81, 2018.