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A Rule-Based Expert System for the Diagnosis and Treatment of Common Eye Diseases Using CLIPS

Abdullah Osama Abu Salama, Samy S. Abu-Naser

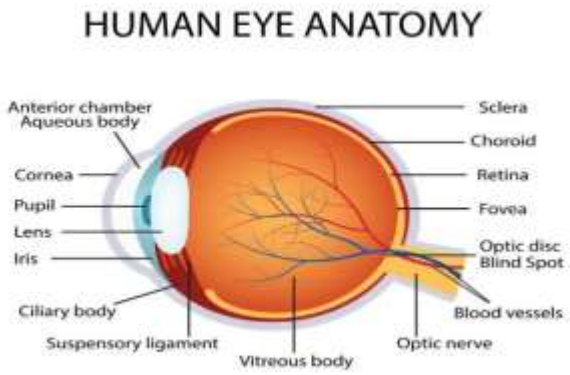
Department Information Technology, Faculty of Engineering and Information Technology,
Al-Azhar University, Gaza, Palestine

Abstract: *Background: The eye is one of the most important organs in the human body, and it is responsible for vision and helps people perform their daily activities. Eye diseases may affect the ability to see clearly and may lead to serious problems if they are not diagnosed and treated early. Therefore, in this paper, some common eye diseases will be identified and diagnosed according to their symptoms. Objectives: The main objective of this expert system is to obtain an appropriate diagnosis of eye diseases and provide suitable recommendations for the user. Methods: In this paper, the expert system is designed to help users detect and diagnose some eye diseases such as conjunctivitis, acute glaucoma, corneal ulcer, eye allergy, uveitis, dry eye syndrome, cataract, myopia, and hyperopia. The system asks the user several yes or no questions about the symptoms that appear, such as eye redness, eye discharge, severe pain, nausea, itching, sensitivity to light, blurred vision, and difficulty seeing near or distant objects. CLIPS expert system language is used for designing and implementing the proposed expert system. Results: The expert system provides the user with the expected diagnosis and a suitable recommendation according to the selected symptoms. Conclusions: The proposed expert system is easy to use and can help users get an initial diagnosis of common eye diseases. It can also be useful for educational purposes, but it does not replace consultation with an eye specialist.*

Keywords: Artificial Intelligence, Expert Systems, CLIPS, Eye Diseases, Diagnosis, Treatment, Rule-Based System

1. INTRODUCTION

The human eye is a very sensitive and important organ because it allows people to see and recognize objects, colors, and movement. Vision helps people perform many daily activities such as reading, writing, studying, driving, and using computers or mobile phones. Therefore, any disease or problem that affects the eye may .[1] affect the quality of life and the ability to do normal activities



[1] The structure of the human eye :1 Figure

Eye diseases can appear through different symptoms. Some symptoms are simple, such as itching, redness, or dryness, while other symptoms may be more serious, such as severe pain, blurred vision, sensitivity to or sudden vision problems. These symptoms can help in identifying the possible eye disease. For ,light example, redness with discharge may indicate conjunctivitis, while severe eye pain with nausea may indicate [3][acute glaucoma. [2

[2] :eye conditions and their symptoms. Source Figure 2: The most common

Early diagnosis of eye diseases is very important because some diseases may become dangerous if they are not treated quickly. Some eye problems need simple care, while others need urgent medical attention. Because of this, using computer systems to help in the diagnosis process can be useful, especially for [4][educational purposes.[3

making ability of a human expert. It -An expert system is a computer program that simulates the decision s answers and reach a suitable 'base and a set of rules to analyze the user depends on a knowledge conclusion. Expert systems are used in many fields such as medicine, agriculture, education, and .engineering

treatment was designed and implemented In this project, an expert system for eye diseases diagnosis and using CLIPS language. The system asks the user ten yes/no questions about eye symptoms such as redness, vision, and difficulty seeing near or discharge, severe pain, nausea, itching, sensitivity to light, blurred s answers, the system gives a possible diagnosis and a suitable 'distant objects. Based on the user .recommendation

The proposed expert system can diagnose some common eye diseases such as conjunctivitis, acute glaucoma, corneal ulcer, eye allergy, uveitis, dry eye syndrome, cataract, myopia, and hyperopia. The .based expert systems work-system is simple, easy to use, and useful for learning how rule

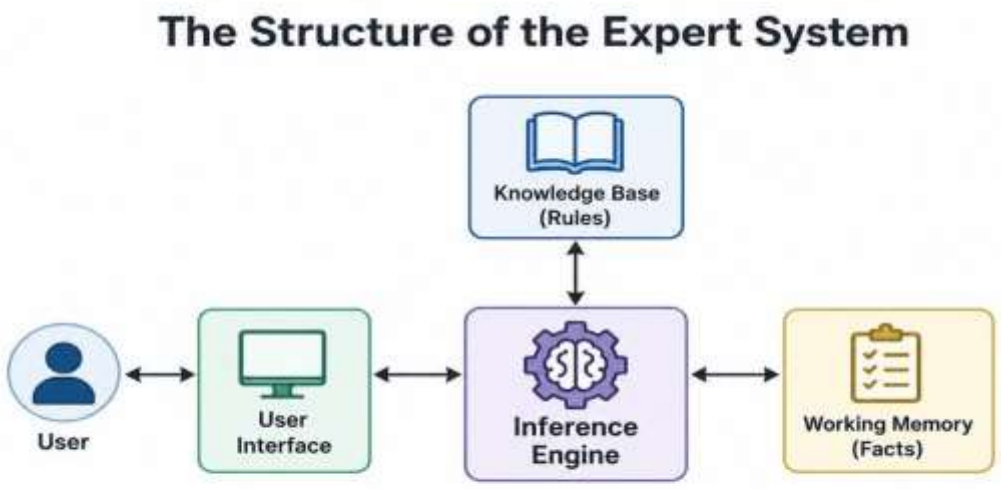
2. MATERIALS AND METHODS

the symptoms entered by the The proposed expert system was designed to diagnose some common eye diseases according to based approach, where each disease is represented by a set of symptoms and the system -user. The system depends on a rule .uses these symptoms to reach the final diagnosis

about common eye diseases and their symptoms. The diseases The main material used in this project is the knowledge included in this expert system are conjunctivitis, acute glaucoma, corneal ulcer, eye allergy, uveitis, dry eye syndrome, cataract, myopia, and hyperopia. The symptoms used in the system include eye redness, eye discharge, severe eye pain, .nausea, itching, sensitivity to light, blurred vision, difficulty seeing distant objects, and difficulty seeing nearby objects

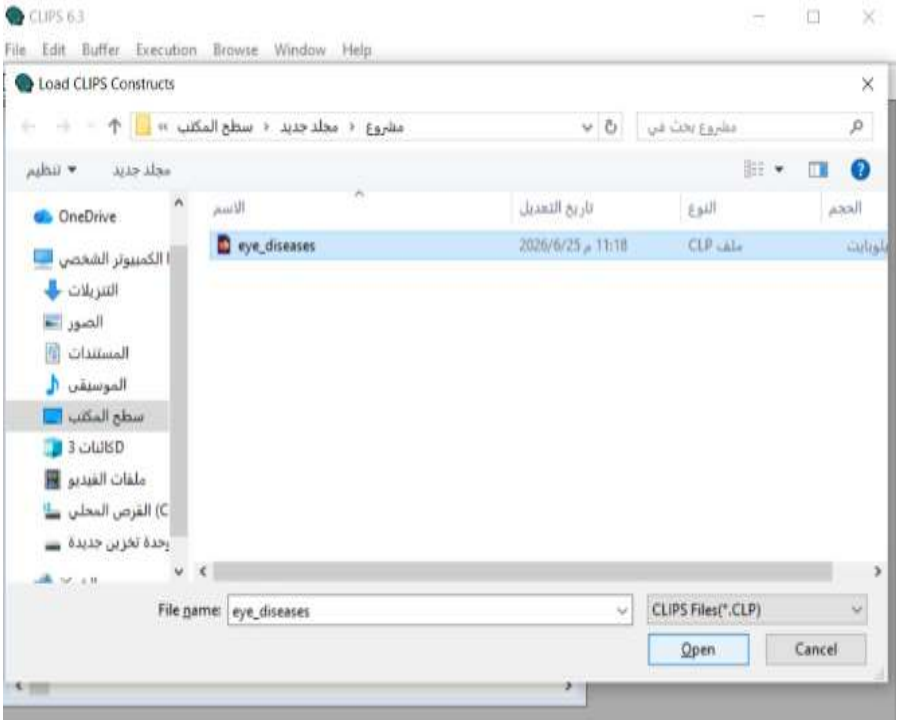
The expert system was implemented using CLIPS language[5]. CLIPS is an expert system tool that is used to represent knowledge in the form of facts and rules. In this project, the user answers a set of yes or no questions. After that, the inference s answers with the rules stored in the knowledge base. When the conditions of a rule are satisfied, 'engine compares the user [6][the system gives the suitable diagnosis and recommendation.[5

The system starts by asking the user whether the eye is red or not. If the answer is yes, the system continues asking questions discharge, pain, nausea, itching, and sensitivity to light. If the answer is no, the system asks related to redness, such as questions related to vision problems, such as blurred vision, difficulty seeing distant objects, and difficulty seeing nearby .answers, the system determines the possible disease s'objects. According to the user

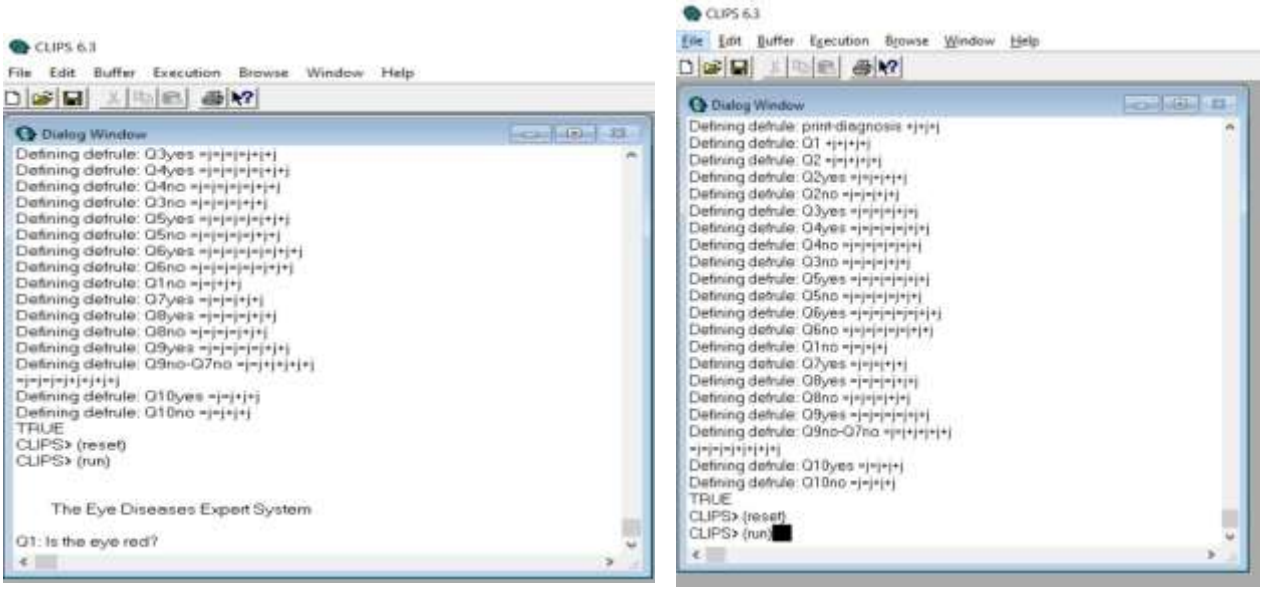


.s design'Figure 3: The structure of the expert system. Source: Author

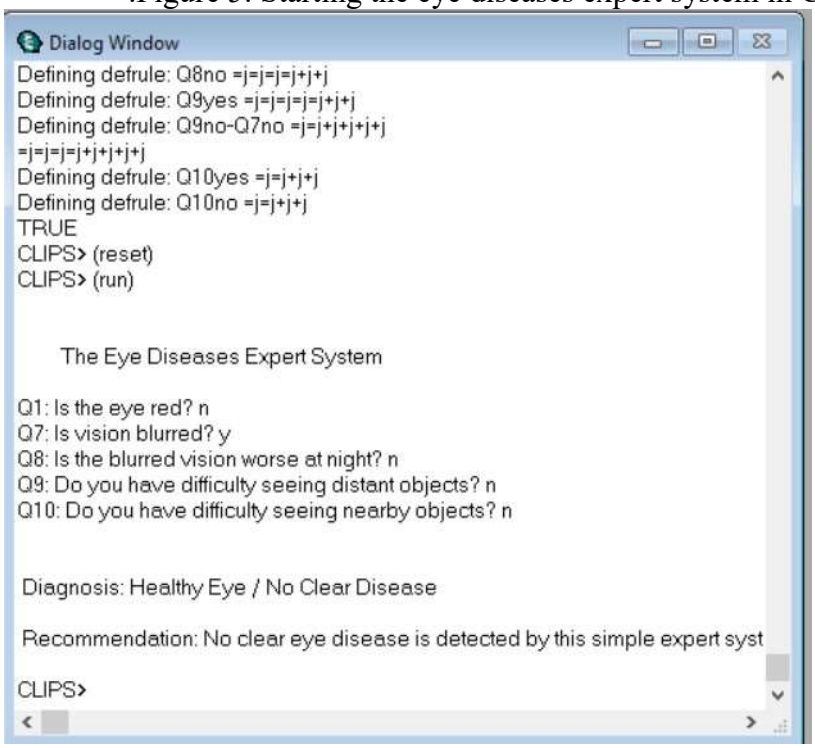
The proposed system consists of three main components. The first component is the user interface, where the user answers the questions. The second component is the knowledge base, which contains the rules and facts about eye diseases. The third component is the inference engine, which analyzes the answers and .produces the diagnosis and recommendation



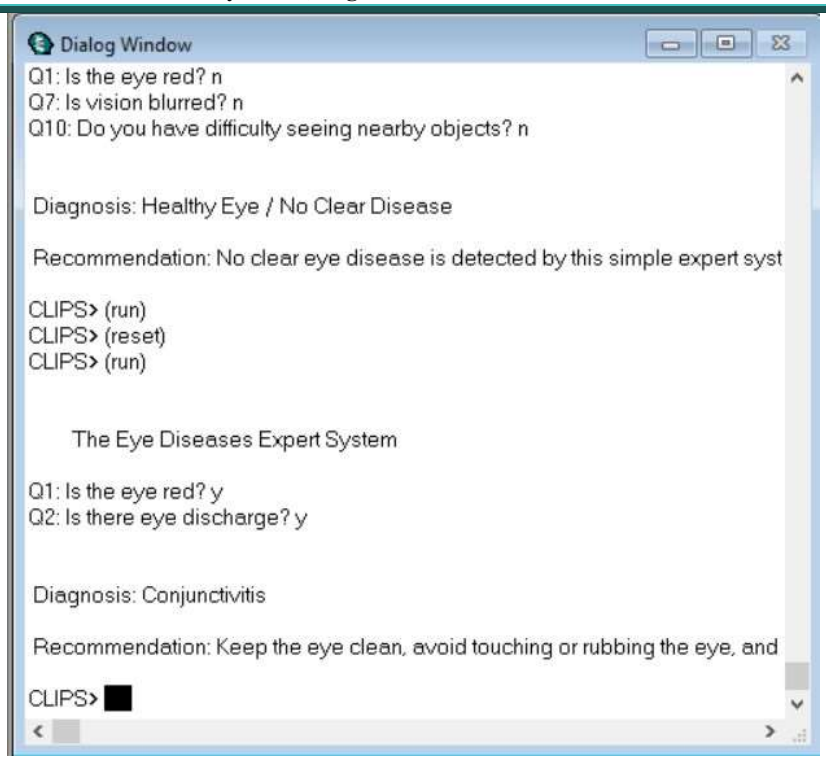
.Figure 4: Loading the eye diseases expert system file in CLIPS



.Figure 5: Starting the eye diseases expert system in CLIPS



. Figure 6: Diagnosis result for Healthy eye / no Clear Disease



.Figure 7: Diagnosis result for Conjunctivitis

The system was tested by running the CLIPS program and entering different answers for the questions. Each result. test case was compared with the expected diagnosis to make sure that the system gives the correct .The output of the system includes the diagnosis name and a simple recommendation for the user

3. LITERATURE REVIEW

Expert systems have been widely used in many fields such as medicine, agriculture, education, and engineering. These systems are designed to simulate the reasoning process of human experts by using a knowledge base and a set of rules. In the medical field, expert systems can help users identify possible .diseases according to symptoms and provide suitable recommendations

systems were developed for diagnosing medical problems. For example, some systems were Several expert designed to diagnose diseases related to the chest, stomach, mouth, shoulder, ear, foot, and other human based reasoning to -health problems. These systems usually ask the user a set of questions and then use rule reach the final diagnosis. This shows that expert systems are useful tools for supporting medical diagnosis [8][and decision making.[6][7

Expert systems have also been used for eye diseases diagnosis[9]. Abu Naser and Ola developed an expert system for diagnosing eye diseases using CLIPS. Their work showed that CLIPS can be used to represent medical knowledge in the form of rules and facts. This is related to the proposed system because the current .project also uses CLIPS to diagnose common eye diseases according to symptoms

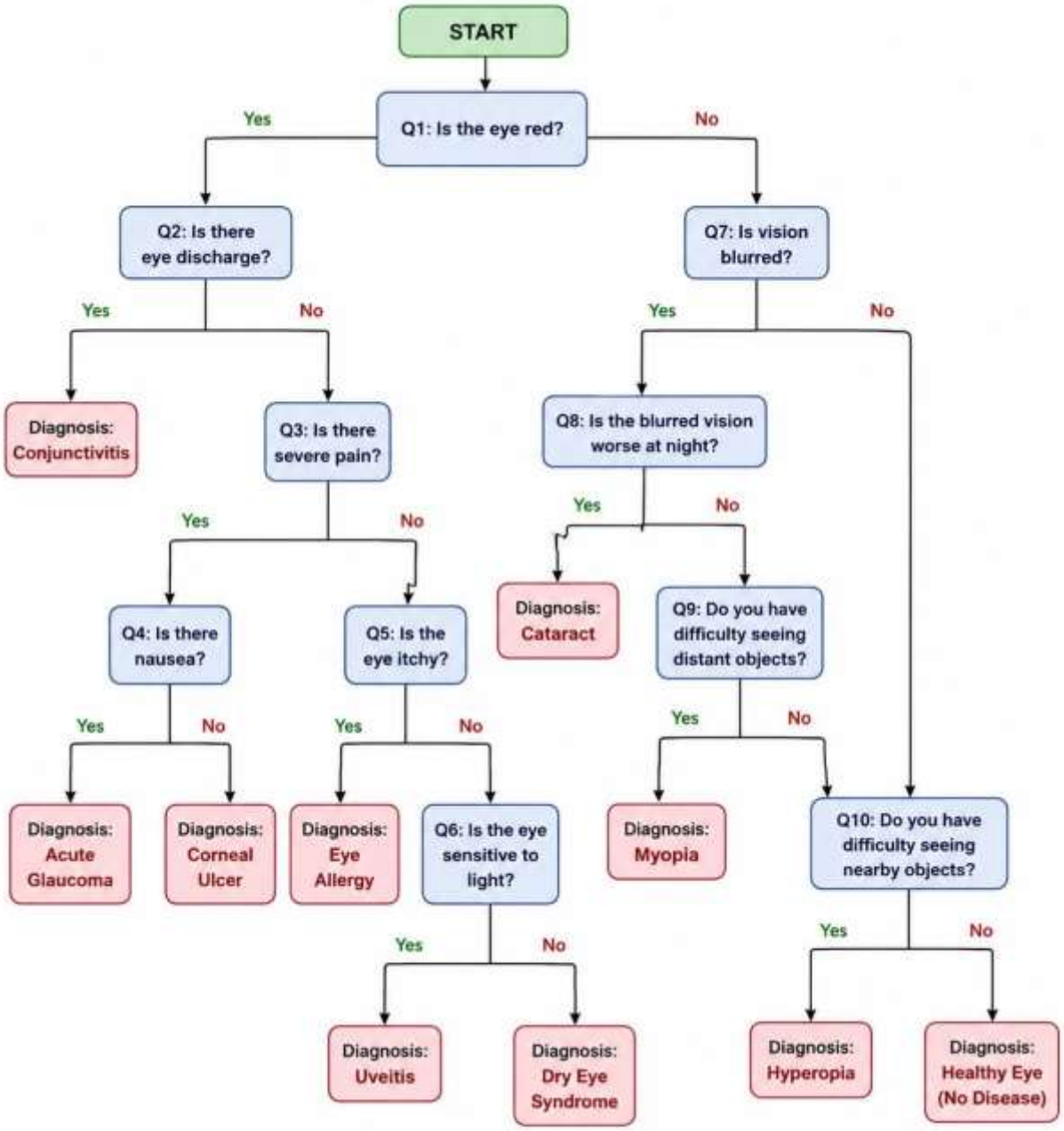
In addition, many expert systems were developed in agriculture to diagnose plant diseases and provide advice to farmers. Examples include expert systems for diagnosing mango diseases, banana problems, onion

disorders, potato problems, watermelon diseases, and other plant diseases. These systems depend on .symptoms selected by the user and then produce a suitable diagnosis and recommendation

based expert systems are useful for diagnosis problems because they are -The previous studies show that rule easy to understand, easy to implement, and can provide fast results. However, many users still need simple educational systems that can help them understand common eye diseases and their symptoms. Therefore, this project proposes an expert system for eye diseases diagnosis and treatment using CLIPS. The system asks ten yes/no questions and diagnoses some common eye diseases such as conjunctivitis, acute glaucoma, [12][eye syndrome, cataract, myopia, and hyperopia.[10][11 corneal ulcer, eye allergy, uveitis, dry

KNOWLEDGE REPRESENTATION .4

The main sources of the knowledge for this expert system are medical and specialized websites for eye diseases and their symptoms. The captured knowledge has been converted into a CLIPS knowledge base. Currently, the expert system has a number of rules which cover nine common eye diseases and one normal [13][case.[3][4



s design'Figure 8: Decision tree for eye diseases diagnosis. Source: Author

:Conjunctivitis 4.1

It has some symptoms that may appear clearly on the eye, such as eye redness and eye discharge. The patient may also feel irritation, burning, or discomfort in the eye. In this expert system, conjunctivitis is diagnosed when the user answers that the eye is red and there is eye discharge. The system gives a recommendation to keep the eye clean, avoid touching or rubbing the eye, and visit an eye doctor if the .symptoms continue

:Acute Glaucoma 4.2

It has some serious symptoms such as red eye, severe eye pain, and nausea. This disease may be dangerous because it can affect vision if it is not treated quickly. In this expert system, acute glaucoma is diagnosed when the user answers that the eye is red, there is no discharge, there is severe eye pain, and there is nausea. .The system gives an urgent recommendation to go to an eye doctor or emergency department immediately

[14] :Figure 9: The figure shows the acute glaucoma disease effect. Source

:Corneal Ulcer 4.3

symptoms such as eye redness and severe pain without nausea. The patient may feel discomfort It has some in the eye and may have difficulty opening the eye normally. In this expert system, corneal ulcer is diagnosed no eye discharge, there is severe eye pain, and there is no when the user answers that the eye is red, there is nausea. The system recommends avoiding contact lenses and visiting an eye doctor as soon as possible

.

[15] :Figure 10: The figure shows the corneal ulcer disease effect. Source

:Eye Allergy 4.4

It has some symptoms such as red eye and itching. The patient may feel irritation, tearing, or discomfort, especially when exposed to dust or allergens. In this expert system, eye allergy is diagnosed when the user is no discharge, there is no severe pain, and the eye is itchy. The system answers that the eye is red, there .recommends avoiding dust and allergens and not rubbing the eye

[16] :Figure 11: The figure shows the eye allergy disease effect. Source

:Uveitis 4.5

It has some symptoms such as red eye and sensitivity to light. The patient may also feel pain or blurred vision in some cases. In this expert system, uveitis is diagnosed when the user answers that the eye is red, there is no discharge, there is no severe pain, the eye is not itchy, and the eye is sensitive to light. The system recommends .seeing an eye doctor quickly, especially if there is pain or blurred vision

[17] :Figure 12: The figure shows the uveitis disease effect. Source

:Dry Eye Syndrome 4.6

such as eye redness, dryness, irritation, and discomfort. It may appear when the eye It has some symptoms does not produce enough tears or when the tears evaporate quickly. In this expert system, dry eye syndrome no discharge, there is no severe pain, the eye is diagnosed when the user answers that the eye is red, there is is not itchy, and there is no sensitivity to light. The system recommends resting the eyes, avoiding dry air .and long screen time, and consulting a doctor if symptoms persist

[18] :the dry eye syndrome effect. Source Figure 13: The figure shows

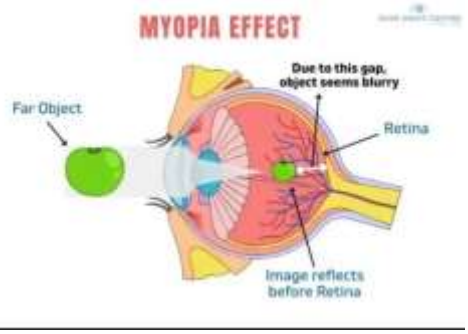
:Cataract 4.7

It has some symptoms such as blurred vision, especially when the blurred vision becomes worse at night. The patient may have difficulty seeing clearly and may need stronger light for reading or other activities. In this expert system, cataract is diagnosed when the user answers that the eye is not red, vision is blurred, and blurred vision becomes worse at night. The system recommends visiting an eye doctor for examination and .suitable treatment

[19] :Figure 14: The figure shows the cataract disease effect. Source

:Myopia 4.8

It has some symptoms such as difficulty seeing distant objects clearly. The patient can usually see nearby diagnosed when the user answers that the eye objects better than far objects. In this expert system, myopia is is not red, vision is blurred, the blurred vision is not worse at night, and there is difficulty seeing distant or objects. The system recommends visiting an optometrist or eye doctor to check the need for glasses .contact lenses



[20] :Figure 15: The figure shows the myopia vision effect. Source

:Hyperopia 4.9

It has some symptoms such as difficulty seeing nearby objects clearly. The patient may feel eye strain while reading or using a computer for a long time. In this expert system, hyperopia is diagnosed when the user answers that the eye is not red, vision is blurred, the blurred vision is not worse at night, there is no difficulty system recommends visiting an seeing distant objects, and there is difficulty seeing nearby objects. The .optometrist or eye doctor to check the need for corrective lenses

[21] :Figure 16: The figure shows the hyperopia vision effect. Source

:Healthy Eye / No Clear Disease 4.10

clear symptoms according to the questions used in this expert This case means that the user does not have system. In this expert system, a healthy eye or no clear disease is diagnosed when the user answers that the eye is not red, vision is not blurred, and there is no difficulty seeing nearby objects. The system gives a recommendation that no clear eye disease is detected by this simple expert system, but if symptoms appear .or become serious, the user should see a doctor

[22] :Figure 17: The figure shows the healthy eye condition. Source

SYSTEM EVALUATION .5

The proposed expert system was evaluated by testing different cases in CLIPS. The main goal of the evaluation was to make sure that the system asks the correct questions, follows the decision tree correctly, s answers. The system was 'and gives the suitable diagnosis and recommendation according to the user .tested using several possible combinations of answers

Each test case represents a different path in the decision tree. After running the system, the output diagnosis was compared with the expected diagnosis. The results showed that the system was able to diagnose the .selected eye diseases correctly

The evaluation results show that the expert system works correctly for the selected test cases. The system the final diagnosis with a suitable recommendation. The asks the user simple yes/no questions and provides .system is also easy to use because it does not require the user to have medical or technical knowledge

However, the proposed expert system has some limitations. It can diagnose only the diseases included in the knowledge base. Also, the system gives an initial diagnosis only and does not replace consultation with an eye doctor. In the future, the system can be improved by adding more eye diseases, more symptoms, images, .and a graphical user interface

LIMITATIONS .6

The proposed expert system has some limitations. It can diagnose only the eye diseases included in the knowledge base. The system depends on yes/no questions only, so it may not cover all possible symptoms or system does not have a graphical user interface, because it runs only in the complicated cases. Also, the CLIPS environment. Therefore, the user must interact with the system through text commands and answers. it does not replace consultation Finally, the system provides an initial diagnosis and recommendation, but .with an eye specialist

FUTURE WORK .7

In the future, the expert system can be improved by adding more eye diseases and more symptoms. Images for each disease can also be added to help users understand the symptoms better. In addition, a graphical .user interface can be developed to make the system easier and more interactive for users

CONCLUSION .8

In this paper, an expert system for eye diseases diagnosis and treatment was presented. The proposed system based approach to diagnose some common -was implemented using CLIPS language and depends on a rule eye diseases. The system asks the user ten yes/no questions about symptoms such as eye redness, discharge, severe pain, nausea, itching, sensitivity to light, blurred vision, difficulty seeing distant objects, and s answers, the system analyzes the symptoms and 'According to the user .difficulty seeing nearby objects gives a possible diagnosis with a suitable recommendation. The expert system can diagnose several eye problems such as conjunctivitis, acute glaucoma, corneal ulcer, eye allergy, uveitis, dry eye syndrome, cataract, myopia, and hyperopia. The system was tested using different cases, and the results showed that it follows the decision tree correctly and provides the expected diagnosis. The proposed expert system is simple, easy to use, and useful for educational purposes. However, it does not replace consultation with an .eye specialist, especially in serious cases such as severe pain or sudden vision problems

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References

[1] .2016 ,8-World Wide Journal of Multidisciplinary Research and Development, vol. 2, no. 5, pp. 1 ,"An expert system for shoulder problems using CLIPS"Naser, Samy S, et al., -Abu
[2] .2020 ,13-International Journal of Academic Information Systems Research (IJAISR), vol. 4, no. 3, pp. 1 ,"Diagnosis 19-Expert System for COVID"Salman, Fatima M, et al.,
[3] .2016 ,47-World Wide Journal of Multidisciplinary Research and Development, vol. 2, no. 4, pp. 41 ,"Ear Diseases Diagnosis Expert System Using SL5 Object"Naser, Samy S, et al., -Abu
[4] .2020 ,9-International Journal of Academic Engineering Research (IJAER), vol. 4, no. 4, pp. 1 ,"Using SL5 (19-for Diagnosing Coronavirus (COVID An Expert System"Almadhoun, Husam R, et al.,
[5] .2016 ,31-World Wide Journal of Multidisciplinary Research and Development, vol. 2, no. 4, pp. 25 ,"A Ruled Based System for Ear Problem Diagnosis and Treatment"Naser, Samy S, et al., -Abu
[6] .2016 ,117-International Journal of Medicine Research, vol. 1, no. 2, pp. 114 ,"An expert system for nausea and vomiting problems in infants and children"Naser, Samy S, et al., -Abu
[7] .Journal of Theoretical & Applied Information Technology, vol. 4, no. 7, 2008 ,"An Agent Based Intelligent Tutoring System For Parameter Passing In Java Programming"bu Naser, Samy,
[8] .Journal of Theoretical & Applied Information Technology, vol. 4, no. 10, 2008 ,"An Expert System For Diagnosing Eye Diseases Using CLIPS."Naser, Samy Saleem, et al., -Abu
[9] .2021 ,66-57 .International Journal of Engineering and Information Systems (IJEAIS), vol. 5, no. 4, pp ,"An Expert System for Ankle Problems"Elhabil, Basel Y, et al.,
[10] .2021 ,16-International Journal of Academic Information Systems Research (IJAISR), vol. 5, no. 5, pp. 5 ,"Expert System for Hib Problems"Elhabil, Basel Y, et al.,
[11] .2015 ,37-International Journal of Soft Computing, Mathematics and Control (IJSCMC), vol. 4, no. 4, pp. 25 ,"Sl5 Object: Simpler Level 5 Object Expert System Language"Naser, Samy S, -Abu
[12] .2021 ,66-no. 4, pp. 59 ,5 .International Journal of Academic Information Systems Research (IJAISR), vol ,"Expert System for Knee Problems Diagnosis"Samhan, Lamis F, et al.,
[13] .2021 ,36-International Journal of Academic Information Systems Research (IJAISR), vol. 5, no. 5, pp. 29 ,"Swelling Using CLIPS-Expert System Diagnosing Facial"Alkahlout, Mohammed A, et al.,
[14] .2021 ,28-International Journal of Academic Information Systems Research (IJAISR), vol. 5, no. 5, pp. 23 ,"Expert system for the diagnosis of high blood pressure diseases"Mansour, Aysha I, et al.,
[15] .2021 ,12-International Journal of Academic Engineering Research (IJAER), vol. 5, no. 6, pp. 7 ,"Delphi languages Knowledge Based System for Diagnosing Throat Problem CLIPS and"Alkahlout, Mohammed A, et al.,
[16] .2021 ,8-pp. 1 ,rnal of Academic Information Systems Research (IJAISR), vol. 5, no. 7 ,"An Expert System for Neck Pain Diagnosis"Alfarra, Amjad H, et al.,
[17] .2021 ,67-International Journal of Academic Information Systems Research (IJAISR), vol. 5, no. 5, pp. 57 ,"Lower Back Pain Expert System Using CLIPS"Aish, Mohammed A, et al.,
[18] .2021 ,56-International Journal of Academic Information Systems Research (IJAISR), vol. 5, no. 5, pp. 37 ,"term Abdominal Pain (Stomach Pain) Diagnosis and Treatment-Expert System for Short"Masawabe, Marah M, et al., -Al
[19] .2021 ,27-International Journal of Academic Engineering Research (IJAER), vol. 5, no. 6, pp. 13 ,"An Expert System for Diagnosing Cough Using SL5 Object"Mansour, Aysha I, et al.,
[20] .2021 ,90-79 .International Journal of Academic Information Systems Research (IJAISR), vol. 5, no. 5, pp ,"Diagnosing Cough Problem Expert System Using CLIPS"Jamie, Tanseem N, et al., -Abu
[21] .2021 ,78-International Journal of Academic Information Systems Research (IJAISR), vol. 5, no. 5, pp. 68 ,"Throat Problems Expert System Using SL5 Object"Alkahlout, Mohammed A, et al.,
[22] .2021 ,42-International Journal of Academic Engineering Research (IJAER), vol. 5, no. 5, pp. 37 ,"Expert System and Treatment Using CLIPS Hair Loss Diagnosis"Hamadaqa, Mohammed Hazem M, et al.,
[23] .International Journal of Academic Information Systems Research (IJAISR), vol. 5, no. 5, 2021 ,"Knowledge Based for Tooth Problems"Alsaqqa, Azmi H, et al.,
[24] .2016 ,168-American Journal of Innovative Research and Applied Sciences, vol. 2, no. 4, pp. 155 ,"A proposed Expert System for Foot Diseases Diagnosis"Naser, Samy Salim, et al., -Abu
[25] .American Journal of Innovative Research and Applied Sciences, vol. 2, no. 4, 2016 ,"Infertility Expert system Diagnoses and Treatment Male"Naser, Samy S., et al., -Abu
[26] .2022 ,33-International Journal of Academic Engineering Research (IJAER), vol. 6, no. 5, pp. 24 ,"A Proposed Expert System for Passion Fruit Diseases"Radwan, Hanan IA, et al.,
[27] .2022 ,66-International Journal of Engineering and Information Systems (IJEAIS), vol. 6, no. 5, pp. 52 ,"A Proposed Expert System for Strawberry Diseases Diagnosis"Sababa, Raed Z, et al.,
[28] .2022 ,40-International Journal of Academic Engineering Research (IJAER), vol. 6, no. 5, pp. 34 ,"Developing an Expert System to Diagnose Tomato Diseases"Qadi, Mohanad H, et al., -Al
[29] .2022 ,256-International Journal of Academic and Applied Research (IJAAR), vol. 6, no. 5, pp. 249 ,"Rule Based System for Diagnosing Lablab Problems"AlQatrawi, Mohammed JA, et al.,
[30] .2022 ,321-Research (IJAMR), vol. 6, no. 5, pp. 305 International Journal of Academic Multidisciplinary ,"A Proposed Expert System for Obstetrics & Gynecology Diseases Diagnosis"Habibi, Mohammed F, et al., -El
[31] .2016 ,446-Journal of Multidisciplinary Engineering Science Studies (JMESS), vol. 2, no. 4, pp. 441 ,"Lower Back Pain Expert System Diagnosis and Treatment"Naser, Samy S, et al., -Abu
[32] .2022 ,28-International Journal of Academic Information Systems Research (IJAISR), vol. 6, no. 5, pp. 22 ,"Mint Expert System Diagnosis and Treatment"al., Megdad, Mosa MM, et
[33] .2022 ,45-International Journal of Academic Engineering Research (IJAER), vol. 6, no. 5, pp. 41 ,"Knowledge Based System for Diagnosing Custard Apple Diseases and Treatment"Ghoul, Mustafa MK, et al., -Al
[34] .2022 ,51-vol. 6, no. 5, pp. 43 ,International Journal of Engineering and Information Systems (IJEAIS) ,"A Proposed Expert System for Broccoli Diseases Diagnosis"LAfi, Ola IA, et al.,
[35] .2022 ,248-International Journal of Academic and Applied Research (IJAAR), vol. 6, no. 5, pp. 237 ,"Proposed Expert System for Pear Fruit Diseases"Hamarnah, Hadeel A, et al., -El
[36] .2022 ,74-International Journal of Engineering and Information Systems (IJEAIS), vol. 6, no. 5, pp. 67 ,"System for Diagnosing Bean Diseases and Treatment Rule Based"Abueleiwa, Mohammed HS, et al.,
[37] .2022 ,45-Journal of Academic Information Systems Research (IJAISR), vol. 6, no. 5, pp. 29 International ,"A Knowledge Based System for Cucumber Diseases Diagnosis"Saloul, Nora JH, et al., -Al
[38] .International Journal of Academic Information Systems Research (IJAISR), vol. 5, no. 4, 2021 ,"An Expert System for Tooth Problems"Elhabil, Basel Y, et al.,
[39] .2022 ,60-International Journal of Academic and Applied Research (IJAAR), vol. 6, no. 6, pp. 53 ,"A knowledge Based System for Diagnosing Persimmon Diseases"Okasha, Sami M, et al.,
[40] .2022 ,45-International Journal of Academic Engineering Research (IJAER), vol. 6, no. 5, pp. 41 ,"Figs Knowledge Based System Disease Diagnosis and Treatment"Harara, Fadi ES, et al.,
[41] .2022 ,95-no. 6, pp. 89 ,International Journal of Engineering and Information Systems (IJEAIS), vol. 6 ,"Expert System to Predict Coriander Diseases-CLIPS"Aslem, YI, et al.,
[42] .2016 ,476-Journal of Multidisciplinary Engineering Science Studies (JMESS), vol. 2, no. 4, pp. 468 ,"An Expert System for Mouth Problems in Infants and Children"Naser, Samy S., et al., -Abu
[43] .2016 ,18-World Wide Journal of Multidisciplinary Research and Development (WWJMRD), vol. 2, no. 4, pp. 12 ,"A Knowledge Based System for Neck Pain Diagnosis"Naser, Samy S, et al., -Abu
[44] .2016 ,33-World Wide Journal of Multidisciplinary Research and Development, vol. 2, no. 5, pp. 27 ,"A proposed rule based system for breasts cancer diagnosis"Naser, Samy S, et al., -Abu
[45] .2017 ,124-vol. 1, no. 4, pp. 116 ,International Journal of Engineering and Information Systems (IJEAIS) ,"Photo Copier Maintenance Knowledge Based System V. 01 Using SL5 Object Language"Naser, Samy S., et al., -Abu
[46] .2023 ,8-International Journal of Academic Engineering Research (IJAER), vol. 7, no. 6, pp. 1 ,"A Proposed Expert System for Diagnosis of Migraine"Hammad, Malak S, et al.,
[47] .1999 ,70-Islamic University Journal Gaza, vol. 7, no. 1, pp. 57 ,"Expert Systems complexity Big O Notation for Measuring"Abu Naser, Samy S,
[48] .2023 ,15-International Journal of Academic Information Systems Research (IJAISR), vol. 7, no. 6, pp. 10 ,"Based Expert System for Heart Palpitations Diagnosis-A CLIPS"Qanoo, Fadi N, et al.,
[49] .2023 ,15-International Journal of Academic Engineering Research (IJAER), vol. 7, no. 6, pp. 9 ,"Based Expert System for Brain Tumor Diagnosis-A CLIPS"Altarazi, Raja E, et al.,
[50] .2023 ,9-International Journal of Academic Information Systems Research (IJAISR), vol. 7, no. 6, pp. 1 ,"A Proposed Expert System for Vertigo Diseases Diagnosis"Borno, Dina F, et al., -Al
[51] .2023 ,37-Academic Engineering Research (IJAER), vol. 7, no. 6, pp. 30 International Journal of ,"An Expert System for Diagnosing Mouth Ulcer Disease Using CLIPS"Murad, Walid F, et al.,
[52] .2023 ,37-no. 6, pp. 27 ,International Journal of Academic Information Systems Research (IJAISR), vol. 7 ,"An Expert System for Diagnosing West Nile virus Problem Using CLIPS"Eleyan, Husam Abd Rahim, et al.,
[53] .2023 ,8-International Journal of Engineering and Information Systems (IJEAIS), vol. 7, no. 6, pp. 1 ,"An Expert System for Diagnosing Whooping Cough Using CLIPS"Mahmum, Abedeleilah S, et al.,
[54] .2023 ,26-International Journal of Engineering and Information Systems (IJEAIS), vol. 7, no. 6, pp. 17 ,"Identification Expert System Mango Pests"Altayeb, Jehad M, et al.,
[55] .2023 ,22-International Journal of Academic Engineering Research (IJAER), vol. 7, no. 6, pp. 16 ,"Development and Evaluation of an Expert System for Diagnosing Kidney Diseases"Albadrasawi, Shahd J, et al.,
[56] .2023 ,26-pp. 16 ,6 .International Journal of Academic Information Systems Research (IJAISR), vol. 7, no ,"Developing an Expert System to Computer Troubleshooting"El Kahlout, Faten, et al.,
[57] .2023 ,45-International Journal of Academic Information Systems Research (IJAISR), vol. 7, no. 6, pp. 38 ,"Knowledge Based System for Diagnosing Lung Cancer Diagnosis and Treatment"Jamala, Mohammed N, et al.,
[58] .2023 ,18-International Journal of Academic Information Systems Research (IJAISR), vol. 7, no. 6, pp. 9 ,"Developing an Expert System to Diagnose Malaria" ,.Qaoud, Alaa NN, et al
[59] .2023 ,45-International Journal of Engineering and Information Systems (IJEAIS), vol. 7, no. 6, pp. 37 ,"Developing an Expert System to Warts and Verruca"Harazin, Dalia, et al.,
[60] .2023 ,50-International Journal of Academic Engineering Research (IJAER), vol. 7, no. 6, pp. 38 ,"Based System for Diagnosis and Treatment Recommendation of Neonatal Diseases Using CLIPS-Developing a Knowledge"Wishah, Nida D, et al.,
[61] .2023 ,29-International Journal of Academic Engineering Research (IJAER), vol. 7, no. 6, pp. 23 ,"Based System for the Diagnosis of Flatulence-Knowledge"Tantawi, Jihad, et al.,
[62] .2023 ,52-International Journal of Academic Information Systems Research (IJAISR), vol. 7, no. 6, pp. 46 ,"Development and Evaluation of an Expert System for Diagnosing Tinnitus Disease"et al., ,Almzainy, Mohammed M
[63] .2023 ,51-International Journal of Engineering and Information Systems (IJEAIS), vol. 7, no. 6, pp. 46 ,"System Breast Cancer Knowledge Based"Aldeeb, Mohammed H, et al.,
[64] .2023 ,36-International Journal of Engineering and Information Systems (IJEAIS), vol. 7, no. 6, pp. 27 ,"Based System for Diagnosing Colon Cancer-Knowledge"Albanna, Rawan N, et al.,
[65] .2023 ,51-International Journal of Engineering and Information Systems (IJEAIS), vol. 7, no. 6, pp. 46 ,"Knowledge Based System for Breast Cancer Diagnosis"Aldeeb, Mohammed H, et al.,
[66] .2023 ,36-International Journal of Engineering and Information Systems (IJEAIS), vol. 7, no. 6, pp. 27 ,"Based System-Colon Cancer Knowledge"Albanna, Rawan NA, et al.,
[67] .2023 ,50-pp. 39 ,"classes based classification of brain tumors. A comprehensive analysis of 17 distinct-modal MRI-Multi"Taha, Ashraf MH, et al.,
[68] .2016 ,19-World Wide Journal of Multidisciplinary Research and Development, vol. 2, no. 5, pp. 9 ,"Expert system urination problems diagnosis"Naser, Samy S, et al., -Abu
[69] .2025 ,34-International Journal of Academic Information Systems Research (IJAISR), vol. 9, no. 1, pp. 28 ,"Based Nuts Detection Using Deep Learning-Image"Altarazi, Altarazi, et al.,
[70] .2025 ,"Based Strawberry Leaves Classification Using Deep Convolutional Neural Networks-Image"Dwimah, Amal, et al.,
[71] .2017 ,115-International Journal of Engineering & Information Systems (IJEAIS), vol. 1, no. 4, pp. 102 ,"An Expert System For Diagnosing Shortness Of Breath In Infants And Children"Reesh, Jihan Y., et al., -AbuEl
[72] .2025 ,"Based Tomato Leaves Diseases Detection Using Deep Learning-Image"ALJerjaw, Nesreen SIA, et al.,
[73] .2025 ,32-International Journal of Engineering and Information Systems (IJEAIS), vol. 9, no. 6, pp. 23 ,"A proposed accurate system for diagnosing low vision"Qunoo, Mohammed Mostafa, et al.,
[74] .2025 ,12-International Journal of Engineering and Information Systems (IJEAIS), vol. 9, no. 6, pp. 1 ,"Expert System for the Diagnosis of coffee Diseases"Soliman Abu, et al., Mettleq, Malak
[75] .2025 ,79-International Journal of Academic Engineering Research (IJAER), vol. 9, no. 8, pp. 74 ,"Based Systems-Natural Language Processing in Modern Knowledge"AlDammagh, Alaa K, et al.,
[76] .2025 ,73-63 .International Journal of Academic Engineering Research (IJAER), vol. 9, no. 8, pp ,"Teeth Problem Diagnosis Expert System"Alhaj, Ala'a, et al.,
[77] .2025 ,158-International Journal of Academic Engineering Research (IJAER), vol. 9, no. 8, pp. 154 ,"Design and Development of a Clinical Diagnosis Expert System"Ashour, Wesam H, et al.,
[78] .2025 ,153-International Journal of Academic Engineering Research (IJAER), vol. 9, no. 8, pp. 148 ,"Based Systems-From Rules to Reasoning: Impact of NLP on Knowledge"Altallaa, Sahar E, et al.,
[79] .2025 ,94-International Journal of Academic Engineering Research (IJAER), vol. 9, no. 8, pp. 85 ,"Expert System Design and Implementation for Medical Diagnostic Applications"Mohaisen, Basel Midhat, et al.,
[80] .2025 ,115-IJAER), vol. 9, no. 8, pp. 111) International Journal of Academic Engineering Research ,"Based System for Medical Diagnosis-Design and Development of a Knowledge"Kwaik, Hiba Basem Ali Abu, et al.,
[81] .2025 ,99-International Journal of Academic Engineering Research (IJAER), vol. 9, no. 8, pp. 95 ,"Based Systems-Integrating NLP Techniques for Smarter Modern Knowledge"Aydi, Beesan Mohammed, et al., -Al
[82] .2025 ,147-International Journal of Academic Engineering Research (IJAER), vol. 9, no. 8, pp. 129 ,"A Rule Based System for Diagnosing Hypertension Problems"Nesreen Samer, et al., ,ALJerjawi
[83] .2025 ,110-International Journal of Academic Engineering Research (IJAER), vol. 9, no. 8, pp. 100 ,"Knowledge Based System for Diagnosis Tomato Diseases"Alqedra, Heba IA, et al.,
[84] .2025 ,120-International Journal of Academic Engineering Research (IJAER), vol. 9, no. 8, pp. 116 ,"Design and Evaluation of a Fuzzy Expert System for Early Detection of Breast Cancer"Ihlayyel, Mazen S, et al.,
[85] .2016 ,12-no. 9, pp. 7 ,World Wide Journal of Multidisciplinary Research and Development, vol. 2 ,"Detecting Health Problems Related to Addiction of Video Game Playing Using an Expert System"Naser, Samy S, et al., -Abu
[86] .2025 ,165-International Journal of Academic Engineering Research (IJAER), vol. 9, no. 8, pp. 159 ,"Based Systems: Architecture and Case Study-Based Deployment of Knowledge-Cloud"Afifi, Yousef Ahmed, et al., -Al
[87] .2025 ,48-International Journal of Academic Engineering Research (IJAER), vol. 9, no. 8, pp. 44 ,"Based Expert System for Cybersecurity Threat Detection: Evolution, Applications, and the Hybrid AI Paradigm-A Rule"al., Quffa, Abdallah, et
[88] .2025 ,98-International Journal of Academic Information Systems Research (IJAISR), vol. 9, no. 8, pp. 94 ,"Based Sorting Strategies for Automation in Logistics and Supply Chains-AI"Aljerjawi, Nesreen S, et al.,
[89] .2025 ,181-pp. 169 ,"Based Skin Cancer Classification and Localization: A Comprehensive Approach for Accurate Diagnosis and Localization of Skin Cancers-Deep Learning"Qaoud, Alaa N, et al.,
[90] .2026 ,12-Journal of Academic Information Systems Research (IJAISR), vol. 10, no. 2, pp. 1 International ,"Derived Rules-An Interpretable Clinical Expert System for Heart Disease Diagnosis via Decision Tree"Salman, Fatima M, et al.,
[91] .2026 ,77-no. 2, pp. 66 ,10 .International Journal of Academic Information Systems Research (IJAISR), vol ,"Based Eye Classification Using Deep Learning-Image"Musabeh, Taif Jamal Abu, et al.,
[92] .Applications, and the Hybrid AI Paradigm, vol. 10, 2025 ,"Based Expert System for Cybersecurity Threat Detection: Evolution-A Rule"Quffa, Abdallah, et al.,
[93] -World Wide Journal of Multidisciplinary Research and Development, vol. 2, no. 10, pp. 26 ,"appropriate students major: In the faculty of engineering and information technology based systems that determine the-Knowledge"Naser, Samy S, et al., -Abu .2016 ,34
[94] .2016 ,33-International Journal of Information Technology and Electrical Engineering, vol. 5, no. 6, pp. 26 ,"Connection Problems Using SL5 Object Rule Based System for Diagnosing Wireless"Alamawi, Wadee W, et al.,
[95] .2016 ,48-Multidisciplinary Research and Development, vol. 2, no. 9, pp. 38 World Wide Journal of ,"Proposed Expert System for Calculating Inheritance in Islam"Akkila, Alaa N, et al.,