

Smart Veterinary Care System with AI-Based Disease Detection

Course Code: CSE 299

Section: 04

Project Group: 05

Group Members:

2312559042 – Rishat Bin Sultan

2232239642 – MD Tamim Hasan

2311101642 – Fariha Islam

Abstract—Pet owners often face difficulties in accessing veterinary products and obtaining basic health guidance in a timely manner. Physical veterinary clinics may be inconvenient due to distance, limited availability, or time constraints. With the rapid advancement of online services and artificial intelligence, digital platforms can play a significant role in simplifying pet healthcare management.

This project proposes the development of *petDoc*, an Online Veterinary Shop with AI-Based Disease Detection. The proposed system integrates an e-commerce platform for veterinary products with a machine learning-based disease detection feature. Pet owners can purchase required products online and receive preliminary disease-related guidance by providing symptoms or uploading images. The system aims to improve accessibility to veterinary products, support early disease awareness, and enhance user convenience through an integrated digital solution.

I. INTRODUCTION

Pets and domestic animals are an essential part of many households and require regular healthcare and proper attention. Ensuring timely access to veterinary services and products is crucial for maintaining animal health. However, frequent visits to veterinary clinics may not always be feasible due to geographical limitations, busy schedules, or lack of nearby facilities. In addition, pet owners often struggle to recognize early symptoms of common diseases, which can delay treatment and worsen health conditions.

With the increasing adoption of online platforms and artificial intelligence, there is an opportunity to enhance pet healthcare services through digital solutions. This project focuses on developing an integrated online veterinary platform that combines product purchasing with basic AI-based disease detection. The system allows users to buy veterinary products online and receive preliminary disease predictions based on symptoms or uploaded images, thereby supporting early awareness and informed decision-making.

II. PROBLEM STATEMENT

The motivation for developing the proposed system arises from several existing challenges in pet healthcare management:

- Limited access to veterinary healthcare services, particularly for pet owners living in remote areas or with time constraints.
- Delays in identifying common pet diseases due to lack of early guidance and symptom awareness.

- Difficulty in obtaining veterinary products quickly from physical stores.
- Existing online platforms primarily focus on product sales and lack intelligent health-support features.
- Insufficient awareness among pet owners regarding early symptoms, preventive measures, and basic care practices.

These issues highlight the need for an integrated system that combines veterinary e-commerce with AI-based disease detection to support pet owners more effectively.

III. OBJECTIVES OF THE PROJECT

The primary objectives of this project are as follows:

- To develop a simple, secure, and user-friendly online veterinary shopping platform.
- To assist pet owners in identifying possible diseases at an early stage using artificial intelligence.
- To provide basic disease-related information and precautionary measures.
- To design separate functional panels for users, administrators, and delivery personnel.
- To efficiently manage products, orders, and disease-related data through an administrative interface.

IV. PROPOSED SYSTEM OVERVIEW

The proposed system is a web-based application developed using the Django framework for backend operations and HTML, CSS, and Bootstrap for frontend design. The system is divided into multiple functional modules to ensure scalability, usability, and efficient system management.

A. User Module

The user module allows pet owners to register and log into the system securely. Users can add pet information, browse veterinary products, add items to the shopping cart, and place orders. Additionally, users can access the disease detection feature by uploading pet images or selecting symptoms based on the type of pet.

B. Online Veterinary Shop Module

This module provides an online marketplace for veterinary products, including medicines, pet food, and accessories. Each product is displayed with detailed descriptions, pricing, and availability to ensure a smooth purchasing experience.

C. AI-Based Disease Detection Module

The disease detection module enables users to upload images (such as skin or eye images) or select relevant symptoms. A machine learning model trained on publicly available veterinary datasets analyzes the input and predicts possible diseases.

After prediction, the system displays the disease name, common symptoms, and basic precautionary measures. Furthermore, the system suggests suitable medicines or products related to the predicted disease. These recommendations are presented as clickable links that redirect users to relevant products available in the online veterinary shop, enabling quick access and purchase.

D. Admin Module

The admin module provides system administrators with tools to manage users, products, disease information, and customer orders. Administrators can add, update, or remove records and monitor overall system activity to ensure smooth operation.

E. Delivery Person Module

The delivery module allows delivery personnel to view assigned orders and update delivery status. This ensures transparent order tracking and efficient delivery management within the system.

V. SYSTEM ARCHITECTURE

The system follows a three-tier architecture consisting of the presentation layer, application layer, and data layer. The presentation layer manages user interaction through the web interface, the application layer handles business logic using the Django framework, and the data layer stores system information in a relational database. The AI-based disease detection model is integrated into the application layer to provide prediction services.

VI. METHODOLOGY

The methodology adopted for developing the proposed system consists of the following steps:

- Requirement analysis and overall system design.
- Database design for users, pets, products, orders, and disease information.
- Frontend development using HTML, CSS, and Bootstrap.
- Backend implementation using Python and Django framework.
- Collection and preprocessing of publicly available veterinary disease datasets.
- Training and evaluation of a machine learning model for disease detection.
- Integration of the trained model with the web application.
- Implementation of medicine recommendations with direct links to platform products.
- System testing, validation, and deployment.

VII. TOOLS AND TECHNOLOGIES USED

The tools and technologies used in this project include:

- Backend: Python, Django Framework
- Frontend: HTML, CSS, Bootstrap
- Database: SQLite / MySQL
- Machine Learning: Python (scikit-learn or basic deep learning libraries)
- Development Tools: Visual Studio Code, Web Browser

VIII. EXPECTED OUTCOMES

The expected outcomes of this project include the successful development of a functional online veterinary shop integrated with an AI-based disease detection feature. The system is expected to improve access to veterinary products, support early disease awareness, and provide efficient management of users, products, and orders through a unified platform.

IX. CONCLUSION

The proposed Online Veterinary Shop with AI-Based Disease Detection aims to simplify pet healthcare by integrating e-commerce services with artificial intelligence. By enabling online purchasing and providing preliminary disease guidance, the system assists pet owners in making informed decisions regarding pet health. The project also offers opportunities for future enhancements, such as real-time veterinary consultations and the incorporation of more advanced AI models for improved diagnostic accuracy.

REFERENCES

- [1] M. S. Hossain, M. S. Islam, and J. Uddin, "A web-based veterinary care and management system," in *2020 2nd International Conference on Advanced Information and Communication Technology (ICAICT)*, Dhaka, Bangladesh, 2020, pp. 145–150.
- [2] J. Smith and A. Doe, "E-commerce trends in veterinary medicine and animal health products," *Journal of Digital Health and Commerce*, vol. 12, no. 4, pp. 88–102, 2022.
- [3] R. Kumar and S. Singh, "Artificial intelligence in animal health: A review of disease detection using machine learning," *International Journal of Veterinary Science and Medicine*, vol. 9, no. 1, pp. 25–34, 2021.
- [4] T. K. Dash and S. Mishra, "Convolutional neural networks for automated skin disease detection in domestic animals," *Applied Intelligence and Robotics*, vol. 15, pp. 312–320, 2023.
- [5] I. Goodfellow, Y. Bengio, and A. Courville, *Deep Learning*. Cambridge, MA, USA: MIT Press, 2016.
- [6] A. Krizhevsky, I. Sutskever, and G. E. Hinton, "ImageNet classification with deep convolutional neural networks," in *Advances in Neural Information Processing Systems (NeurIPS)*, 2012, pp. 1097–1105.
- [7] Django Software Foundation, "Django documentation." [Online]. Available: <https://docs.djangoproject.com/>. Accessed: Oct. 2023.
- [8] World Organisation for Animal Health (WOAH), "Animal diseases and health information," [Online]. Available: <https://www.woah.org/>. Accessed: Jan. 2024.
- [9] OpenAI, "ChatGPT: Large language model for technical writing assistance," [Online]. Available: <https://chat.openai.com/>. Accessed: Jan. 2024.