

Design Project Final Summary: ADIS: Animal Diagnostic Information System

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Introduction

ADIS is an AI-powered diagnostic support system designed for veterinarians, zoo's, and animal health researchers. It enhances the speed and accuracy of diagnosing external injuries and diseases in zoo animals by combining vision models, a citation-backed AI chatbot, and compliance-checked treatment recommendations. ADIS centralizes its diagnostic workflows, reduces medical lookup time, and supports decision making in critical moments during emergencies or routine care.

Objectives

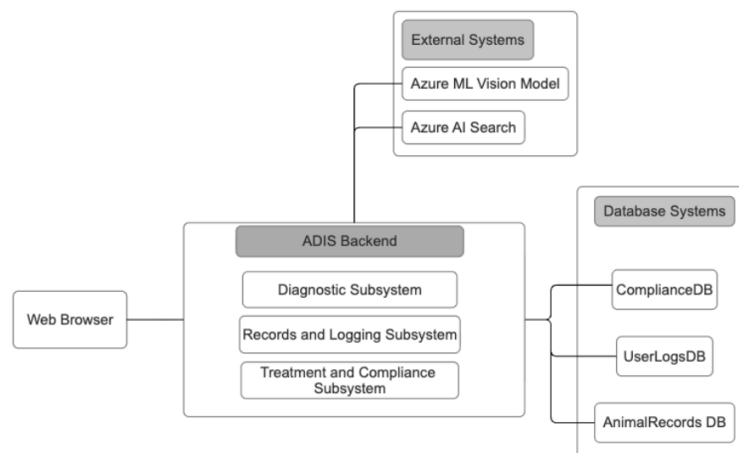
ADIS focuses on five primary goals:

1. **Rapid Diagnostic Support:** Produce image or text based diagnoses in under 5 seconds.
2. **Accurate Injury and Disease Detection:** Achieve at least 80% accuracy on validated datasets.
3. **Evidence-Based Decision Making:** Provide every response with citations from recognized veterinary sources.
4. **Regulatory Compliance:** Automatically cross-check all treatment recommendations with zoo, federal, and veterinary regulations.
5. **Unified Medical Information Access:** Centralize animal records, conditions, and treatment guidelines within one secure platform.

System Design

ADIS is designed with the intent of it being a primarily cloud-based application that uses a client-server architecture. The three major components are:

1. **Azure AI Search:** Responds to symptom-based prompts, gathers the relevant medical guidelines stored in the compliance database.
2. **Azure Vision Model:** Processes the images uploaded by the user. Identifies injuries and returns a diagnosis plus confidence score with supporting citations.
3. **Backend and Database System:**
 - a. **Medical Records DB:** Stores the respective animals' medical history, images, and past diagnoses.
 - b. **Compliance DB:** Contains any dosage rules, treatment guidelines, and regulatory standards.
 - c. **User Logs DB:** Tracks any login, uploads, and diagnostic actions for auditing purposes.



Stakeholders and Use Cases

ADIS serves multiple stakeholders:

1. **Veterinarians** - Faster diagnoses can help them generate treatment plans faster, resulting in an animal not suffering more than they need to.
2. **Researchers** - Reference aggregated animal health data and run queries for trend analysis.
3. **Animal caretakers** - Capture animal images, submit cases and follow compliance-verified treatment plans.

ADIS serves multiple use cases:

1. **Treatment Plan Generation** - This use case is targeted towards veterinarians and occurs after the user interacts with the chatbot. A treatment plan targeted towards an animal's injury/disease will be generated, allowing the user to give the proper help to the animal.
2. **Diagnosis** - This happens after the user uploads an image to the app, or when the chatbot is done processing the user's prompt. Based on the symptoms identified, the app will provide a clear diagnosis of what's going on with the animal.
3. **General Research** - Due to the app providing lots of information based on the input the user gives, it automatically serves as a proper general research tool that can help researchers gain critical information about a certain injury or/and disease.
4. **Chatbot Interaction** - Users type symptoms or questions, ADIS retrieves verified references using Azure AI Search.

Challenges Addressed

Zoo veterinarians and caretakers often face delays due to scattered medical references, slow manual record lookup and limited access to verified treatment protocols.

ADIS addresses these challenges by:

- Automating the diagnosis process through computer vision.
- Centralizing medical records and compliance rules.
- Reducing research and decision making time during emergencies.
- Ensuring treatment recommendations meet all regulatory standards.

Conclusions and Future Scope

ADIS enhances veterinary diagnostics by combining AI-driven analysis with indexed verified medical information and compliance checks. This software will reduce diagnostic delay, support emergency decision-making, and combine and gather animal health data into one reliable platform.

Future developments would include:

1. Expanded species coverage and improved model accuracy.
2. Integration with lab systems and additional external medical databases.
3. Offline support for field researchers.
4. Incorporating multilingual chatbot support.
5. Providing a mobile-first interface for on-site caretakers.