PawSighnt – AI Vet Emotion Analyzer (Hardware + Software System)

Problem Statement & Motivation

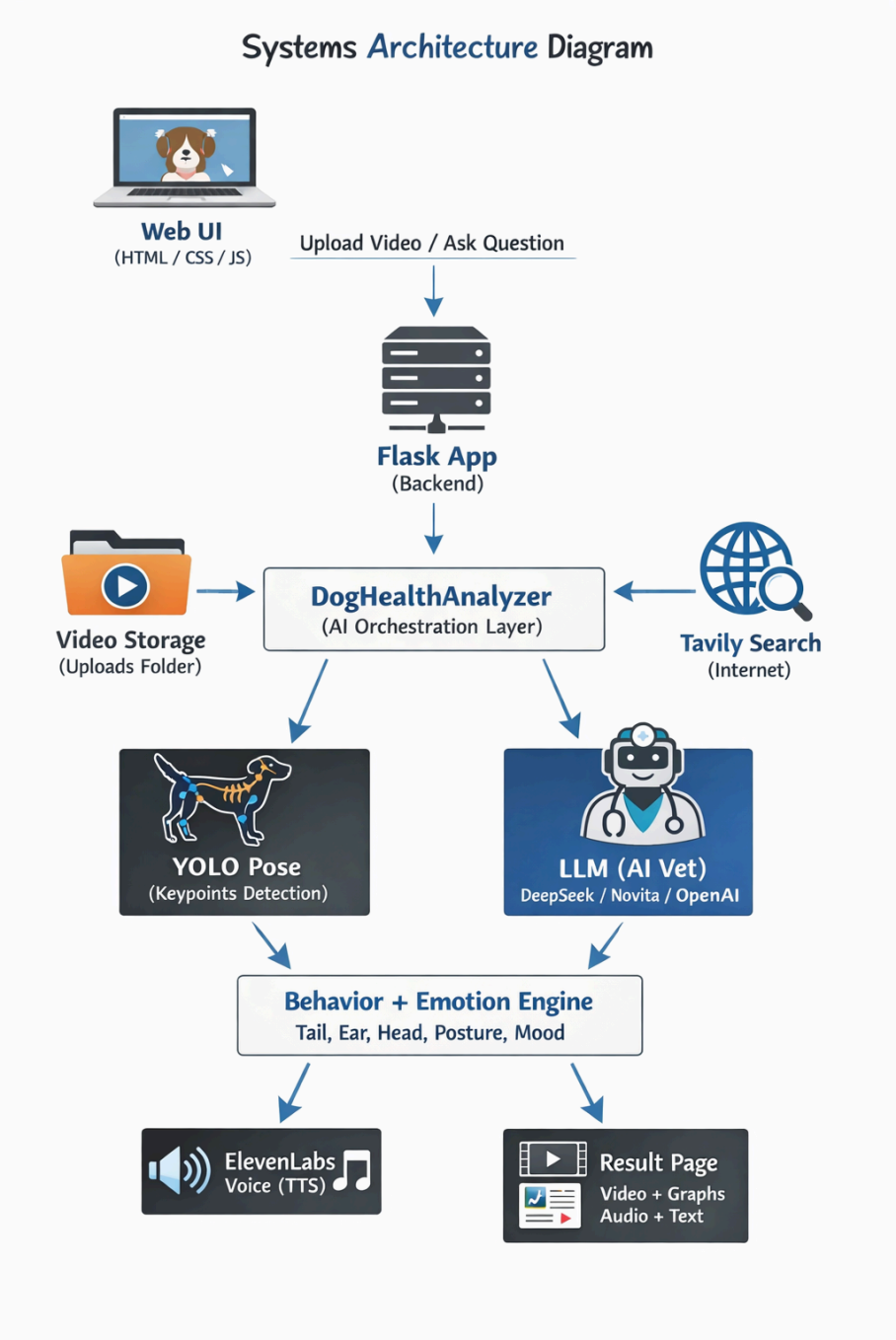
Pet owners often struggle to understand their dog's emotions, stress levels, and health conditions based only on external behavior. Early signs of discomfort, anxiety, or health issues are frequently missed because dogs cannot verbally express their feelings. This gap in understanding can lead to delayed care, unnecessary stress for pets, and avoidable medical complications. PawSighnt is designed to bridge this communication gap using artificial intelligence to interpret dog behavior and emotions in a meaningful and accessible way.

Solution Overview

PawSighnt is an AI-powered veterinary emotion analysis system built as both a software platform and a hardware-integrated solution. It analyzes dog posture, movement, and behavior from video input to determine emotional states such as happiness, stress, activity level, and overall mental well-being. The system presents these insights through a user-friendly interface, AI-generated vet summaries, voice feedback, and visual graphs.

How It Works – Software Implementation

The software version is developed using Flask as the backend framework to manage video uploads, processing, and result visualization. YOLO is used for pose estimation and keypoint detection to track tail, ears, head, and body posture. These keypoints are processed by custom behavior analysis modules to determine emotional and physical states. DeepSeek and Novita are used for AI reasoning to generate a human-readable AI vet summary. ElevenLabs is used to convert the AI vet summary into natural-sounding voice output.



UI Features

- Uploaded video playback
- Emotion analysis results
- AI vet text summary

• ElevenLabs voice feedback
• Behavior graphs over time
• AI chatbot for user questions

Hardware Implementation

The hardware version of PawSighnt runs on the RDK X5 kit with the YOLO model deployed on-device. This enables real-time, edge-based emotion analysis without relying on cloud processing. The hardware setup demonstrates how PawSighnt can be used in smart homes, pet monitoring systems, and future robotic or IoT-based pet care solutions.

Technologies Used

• Flask – Web backend and UI integration
• YOLO – Pose estimation and behavior detection
• DeepSeek & Novita – AI reasoning and language generation
• ElevenLabs – Text-to-speech voice output
• Matplotlib – Graph generation
• RDK X5 Kit – Hardware platform for edge AI implementation

Use Cases

• Pet owners for early detection of stress or discomfort
• Veterinary clinics for behavior assessment support
• Smart home pet monitoring systems
• Animal shelters for welfare monitoring
• Robotic or IoT pet companions

Originality & Innovation

PawSighnt uniquely combines computer vision-based behavior analysis, emotional state inference, AI vet reasoning, voice-based feedback, and hardware-software architecture into a single integrated system focused on animal emotional intelligence.

Scalability & Future Scope

• Multi-animal support (cats, livestock)
• Mobile app version
• Integration with wearables and smart collars
• Personalized behavior tracking using continuous learning models
• Robotics integration for automated pet care systems

Demo & Links

Demo Video: https://youtu.be/cxTBH_GG_ug
Source Code: https://github.com/oneVisionary/nexus.git