## OpenCV Processing

### Real-Time:
Frame Buffering
Threading
OpenCV Processing

RPI Camera → OpenCV → TF Lite Model → Display Result

Display

### Model Preparation

### DL Processing
(Output Extraction
CNN Layers
OpenCV Manipulation)

TF Model → TF Lite Model

---

**Input**

Camera

Sensors

Raspberry Pi OS

TensorFlow Lite Runtime (TFlite Model)

Prediction

Cloud Storage

---

Frame Buffer: Temporary memory storage that holds video frames before processing to ensure smooth operations.

CNN (Convolutional Neural Network): A deep learning architecture specialized for processing image data and pattern recognition.

Feature Extraction: The process where the model identifies important visual patterns in bird images.

Threading: Running multiple processes in parallel to handle real-time video processing more efficiently.

TensorFlow Lite: A lightweight version of TensorFlow optimized for running on smaller devices like Raspberry Pi.

OpenCV: An open-source library used for real-time image and video processing tasks.

RPI (Raspberry Pi): A small, affordable computer used for running the bird detection system.

Processing Time: The duration taken to analyze each frame and make a prediction.