Electrothon 6.0

(Sorcerers of Cipher)

- **Team Name : LEND-EN**

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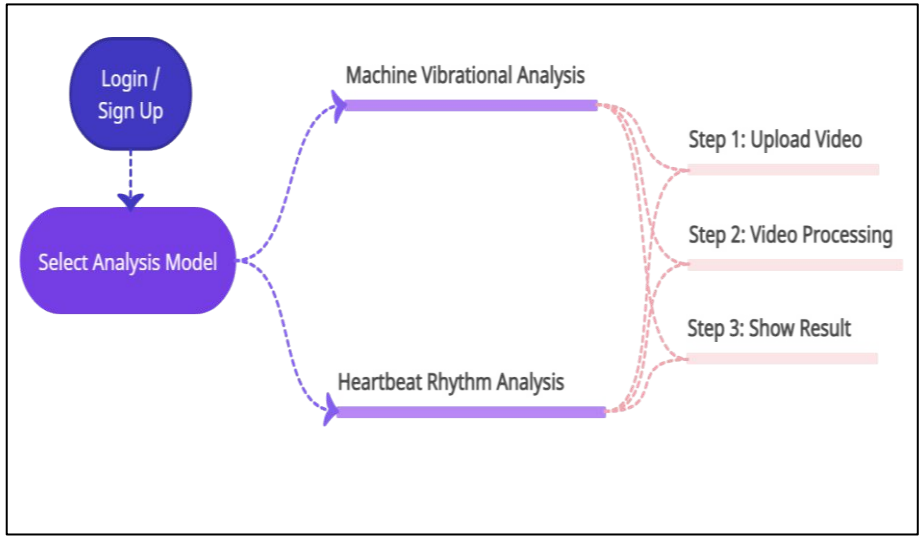
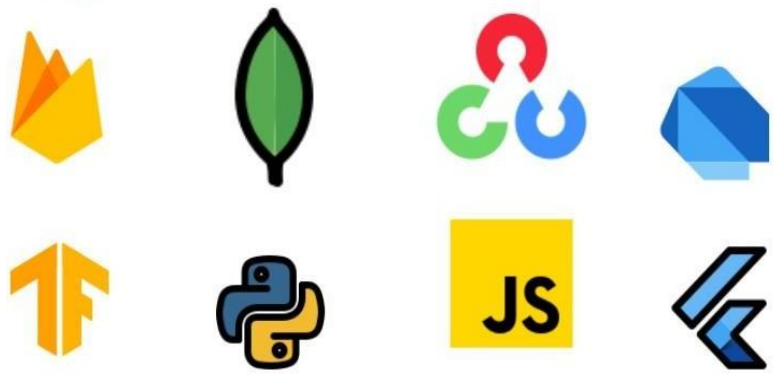
Idea/Approach Details

Our innovative project will merge human as well as machine health monitoring through website and application portal. By harnessing **Video Magnification, Computer Vision**, and **cutting- edge Machine Learning Algorithms**, we will provide machinery insights and comprehensive health reports for the improved efficiency and safety of machines and human well-being.

- The **Flask(Python Framework)** backend will leverage Eulerian Video Magnification Algorithm to enhance video footage. This approach will make subtle motion patterns, vibrations, and color changes more visible which are hard to detect with the naked human eye.
- **Human Health Analysis**: The system utilizes video footage to closely examine human movements, employs computer vision to generate graphs depicting various health parameters, and generates detailed reports using machine learning algorithms. These models categorize human health into different states such as normal, cautionary, and critical, with the assistance of an AI-driven system for detecting health issues or abnormalities.



Technology Stack:



Operational Framework

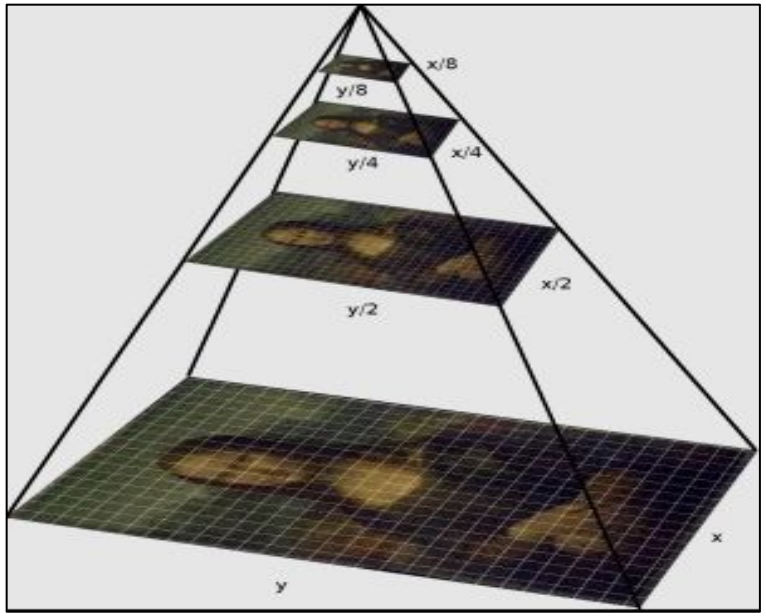
Use Cases

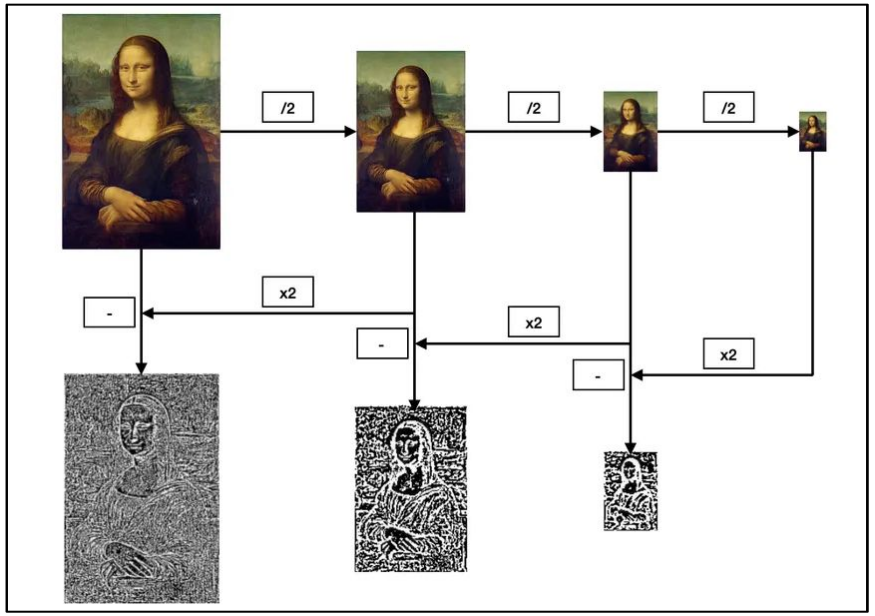
- **Respiratory Rate Monitoring:** Identify irregular breathing patterns and track the frequency of breaths.
- **Heart Rate Monitoring:** Continuously monitor the heart rate to gauge cardiovascular health and assess overall fitness levels.
- **Aircraft Engine Health Analysis :** Using video magnification techniques to assess the health of aircraft engines. Detecting vibrations and micro-scale defects in engines can prevent unexpected failures during missions and improve aircraft reliability.

Dependencies / Show stopper

- **Universal Device Compatibility:** Ours offers flawless performance across a spectrum of devices, including feature phones, iOS, and Android platforms.
- **Regulatory Compliance Sentinel:** Ours is designed as a vigilant guardian of regulatory compliance, ensuring adherence to healthcare standards and industry-specific regulations.
- **Scalable Infrastructure:** Ours is equipped with a scalable infrastructure, allowing it to expand seamlessly with growing demand and usage.

Eulerian Technique Insights:





Gaussian Pyramid:

The Gaussian pyramid is constructed by applying Gaussian smoothing (blurring) and downsampling to an image successively.

The process begins with the original image at the base level (level 0). Then, each subsequent level is generated by applying Gaussian smoothing to the previous level followed by downsampling.

Laplacian Pyramid:

The Laplacian pyramid derived from Gaussian pyramid is constructed by taking the difference between each level of the Gaussian pyramid and an unsampled and smoothed version of its next lower level.

Each level of the Laplacian pyramid represents the high-frequency details that are present between the corresponding levels of the Gaussian pyramid.

Overview:

Prototype Video