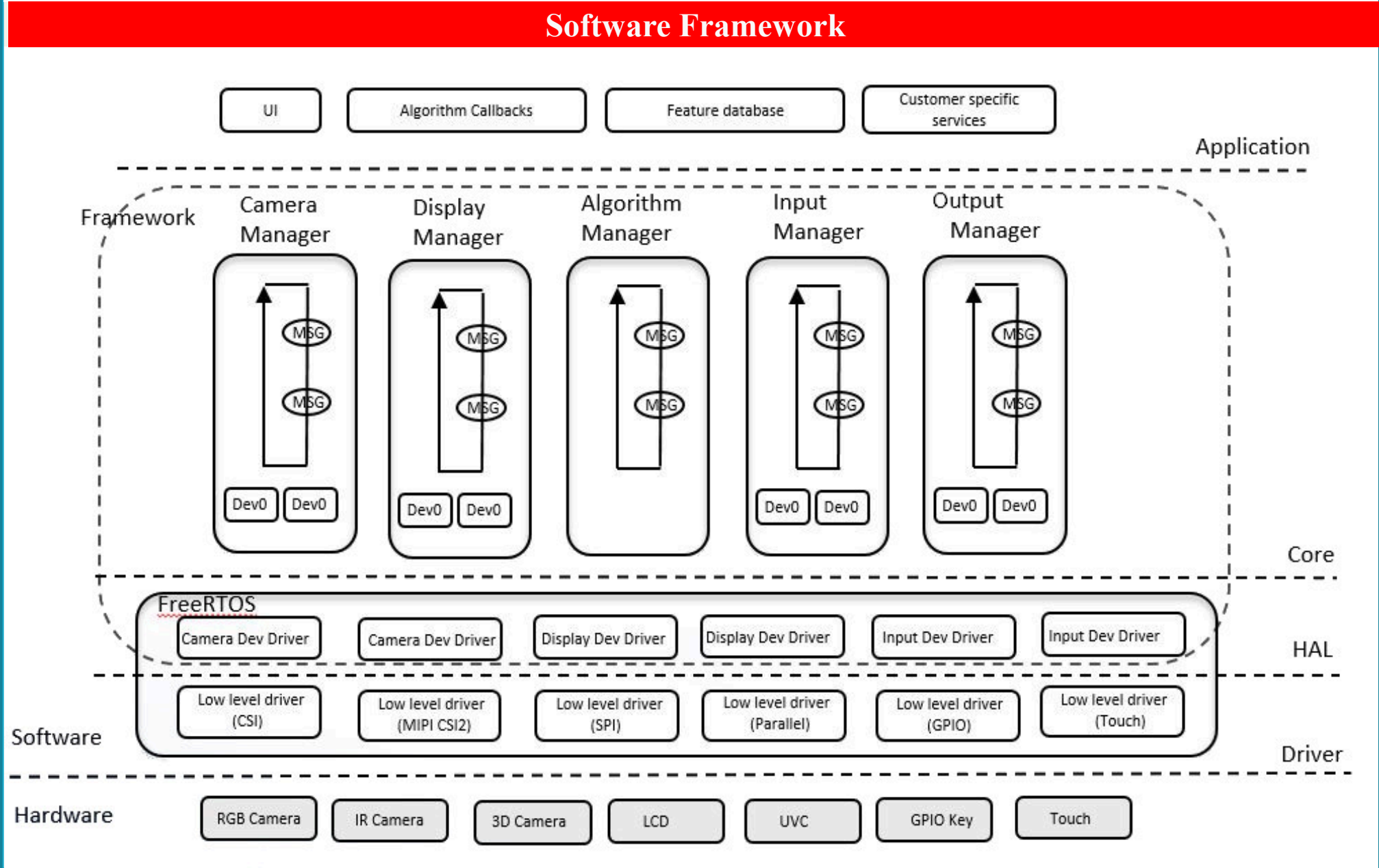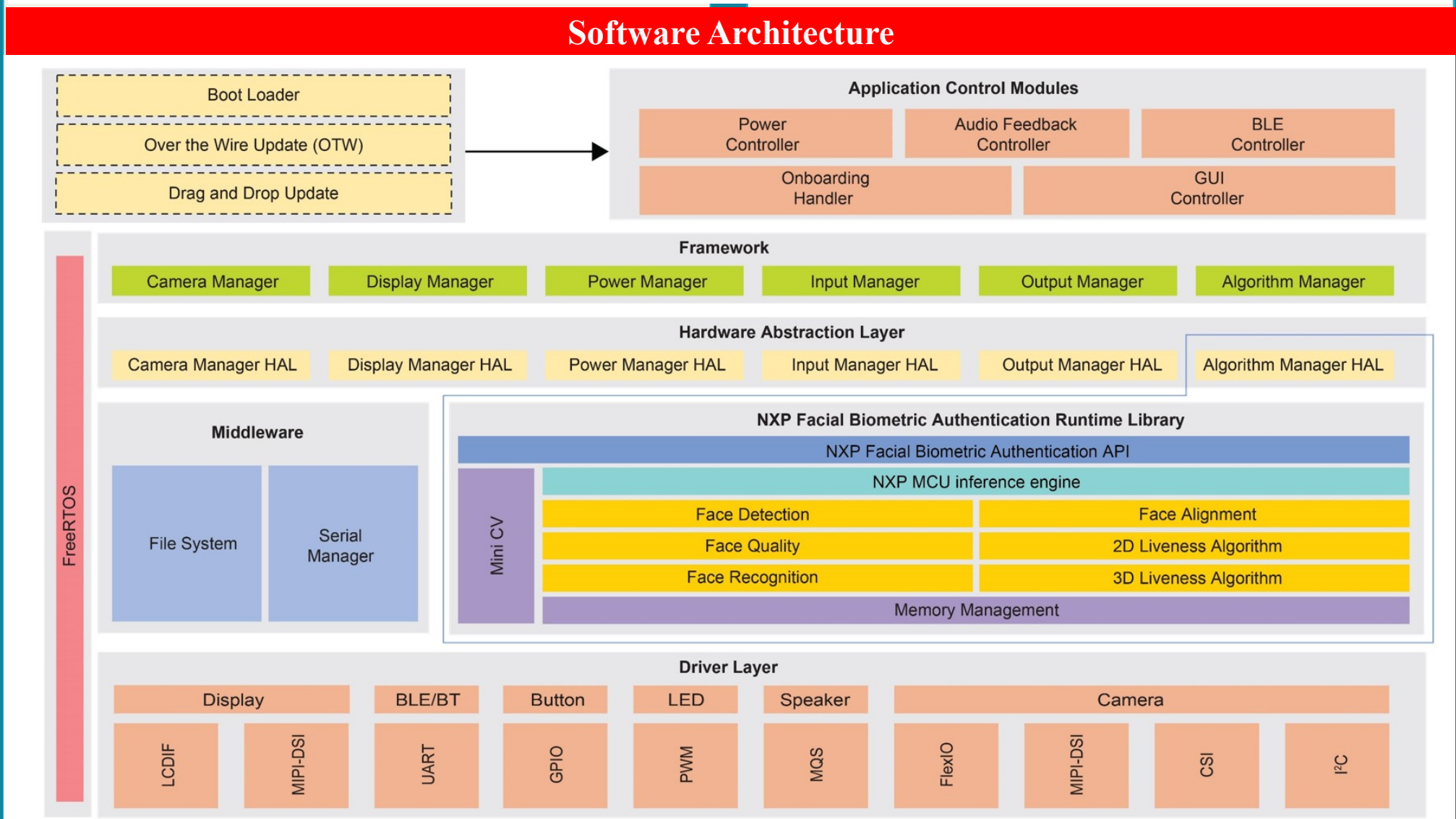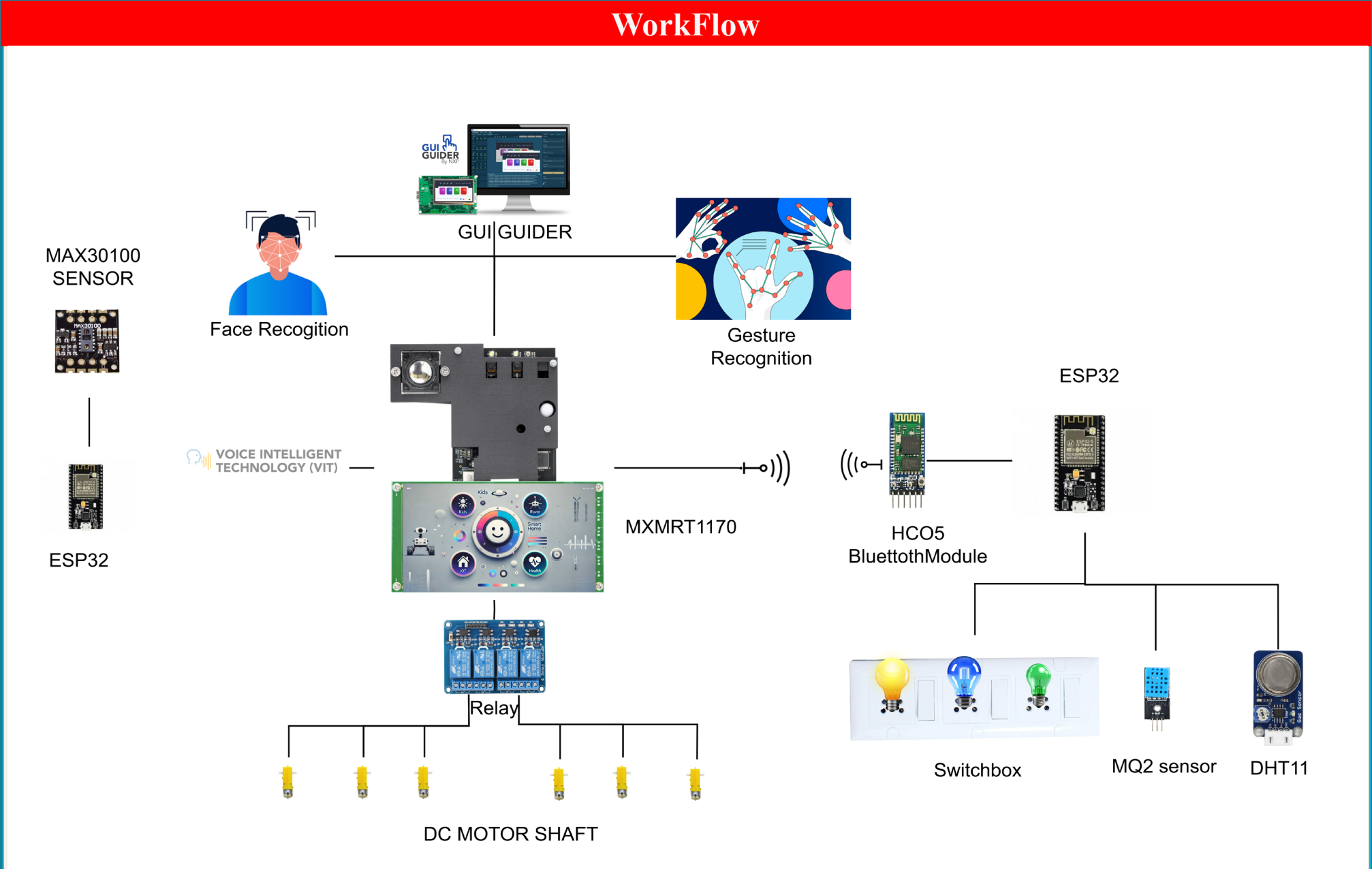# Hey Auxi!!! Your All-in-one-smart home companion

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WorkFlow

- MAX30100 SENSOR
- ESP32
- Face Recognition
- GUI GUIDER
- VOICE INTELLIGENT TECHNOLOGY (VIT)
- Gesture Recognition
- MXMRT1170
- ESP32
- HCO5 BluetothModule
- Relay
- DC MOTOR SHAFT
- Switchbox
- MQ2 sensor
- DHT11

Software Architecture

- Boot Loader
- Over the Wire Update (OTW)
- Drag and Drop Update

Application Control Modules
- Power Controller
- Audio Feedback Controller
- BLE Controller
- Onboarding Handler
- GUI Controller

Framework
- Camera Manager
- Display Manager
- Power Manager
- Input Manager
- Output Manager
- Algorithm Manager

Hardware Abstraction Layer
- Camera Manager HAL
- Display Manager HAL
- Power Manager HAL
- Input Manager HAL
- Output Manager HAL
- Algorithm Manager HAL

Middleware | **NXP Facial Biometric Authentication Runtime Library**
- File System
- Serial Manager
- Mini CV
- NXP Facial Biometric Authentication API
- NXP MCU inference engine
- Face Detection
- Face Alignment
- Face Quality
- 2D Liveness Algorithm
- Face Recognition
- 3D Liveness Algorithm
- Memory Management

Driver Layer
- Display: LCDIF, MIPI-DSI
- BLE/BT: UART
- Button: GPIO
- LED: PWM
- Speaker: MQS
- Camera: FlexIO, MIPI-DSI, CSI, I²C

FreeRTOS

Software Framework

- Application: UI, Algorithm Callbacks, Feature database, Customer specific services
- Framework: Camera Manager, Display Manager, Algorithm Manager, Input Manager, Output Manager
- Core
- FreeRTOS
- HAL: Camera Dev Driver, Display Dev Driver, Input Dev Driver
- Software: Low level driver (CSI), Low level driver (MIPI CSI2), Low level driver (SPI), Low level driver (Parallel), Low level driver (GPIO), Low level driver (Touch)
- Driver
- Hardware: RGB Camera, IR Camera, 3D Camera, LCD, UVC, GPIO Key, Touch

UI

- Kids
- Rover
- Smart Home
- IOT
- Health

KIDS' MODE — Rhymes

IOT — AC, FAN, TV, Yellow Bulb, Green Bulb, Blue Bulb

Feature Highlights

🔥 **On-Device AI with Edge Processing** – Real-time face, gesture, and voice recognition with ultra-low latency on NXP's i.MX RT117H MCU.

🎙 **Far-Field Voice Recognition** – Precise DSP-enhanced voice tracking, enabling seamless hands-free interaction even in noisy environments.

🔒 **AI-Powered Security & Personalization** – Facial ID-based user authentication for personalized automation and enhanced home security.

✋ **Gesture-Based Control** – Advanced ML-powered gesture recognition for touchless smart home operation and accessibility support.

💡 **Adaptive Smart Home Automation** – Learns user behavior to intelligently control lighting, climate, and appliances, optimizing energy efficiency.

🎀 **Emotion-Aware AI Assistant** – Real-time emotion detection and empathetic responses for intuitive human-machine interaction.

♿ **Assistive Technology for Accessibility** – Hands-free voice commands, emergency alerts, and gesture-based control for elderly and disabled users.

📶 **Multi-Protocol Connectivity** – Supports **Wi-Fi, Zigbee, Bluetooth, NFC**, and secure cloud integration for seamless device communication.

🎓 **AI-Enhanced Learning & Interaction** – Multimodal engagement (voice, vision, gestures) for interactive education and adaptive content delivery.

⚡ **Ultra-Efficient Embedded AI** – AI-driven processing optimized for low power consumption, ensuring continuous operation.