

Drive for better vision



Hands-on Himax AI tool and Seed Sensecraft AI

November 26, 2024

Himax Technologies, Inc.
奇景光電股份有限公司

Outline

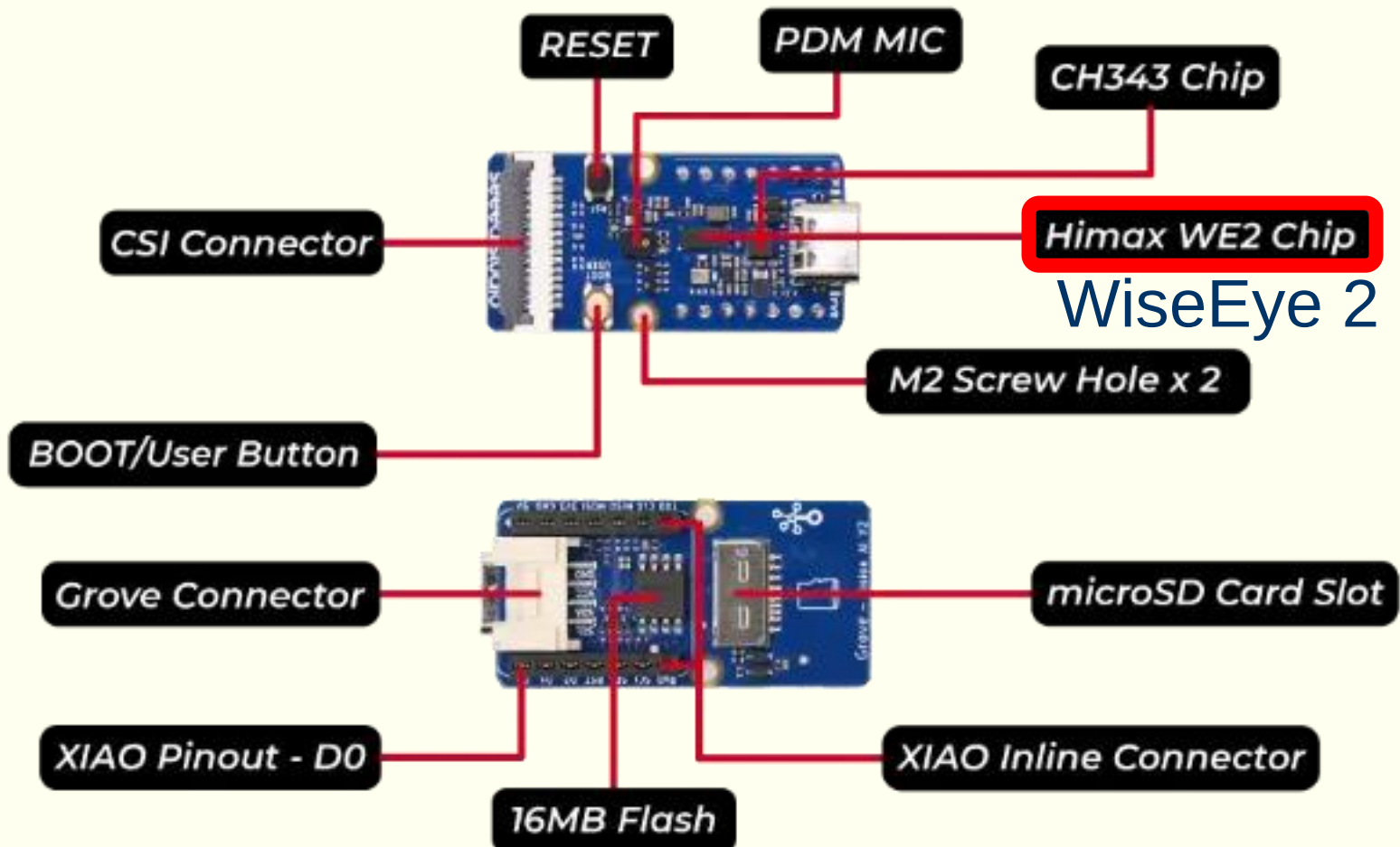
- Hands-on: Himax AI
- Hands-on: Seeed Sensecraft AI
- Development Flow

Hardware Overview



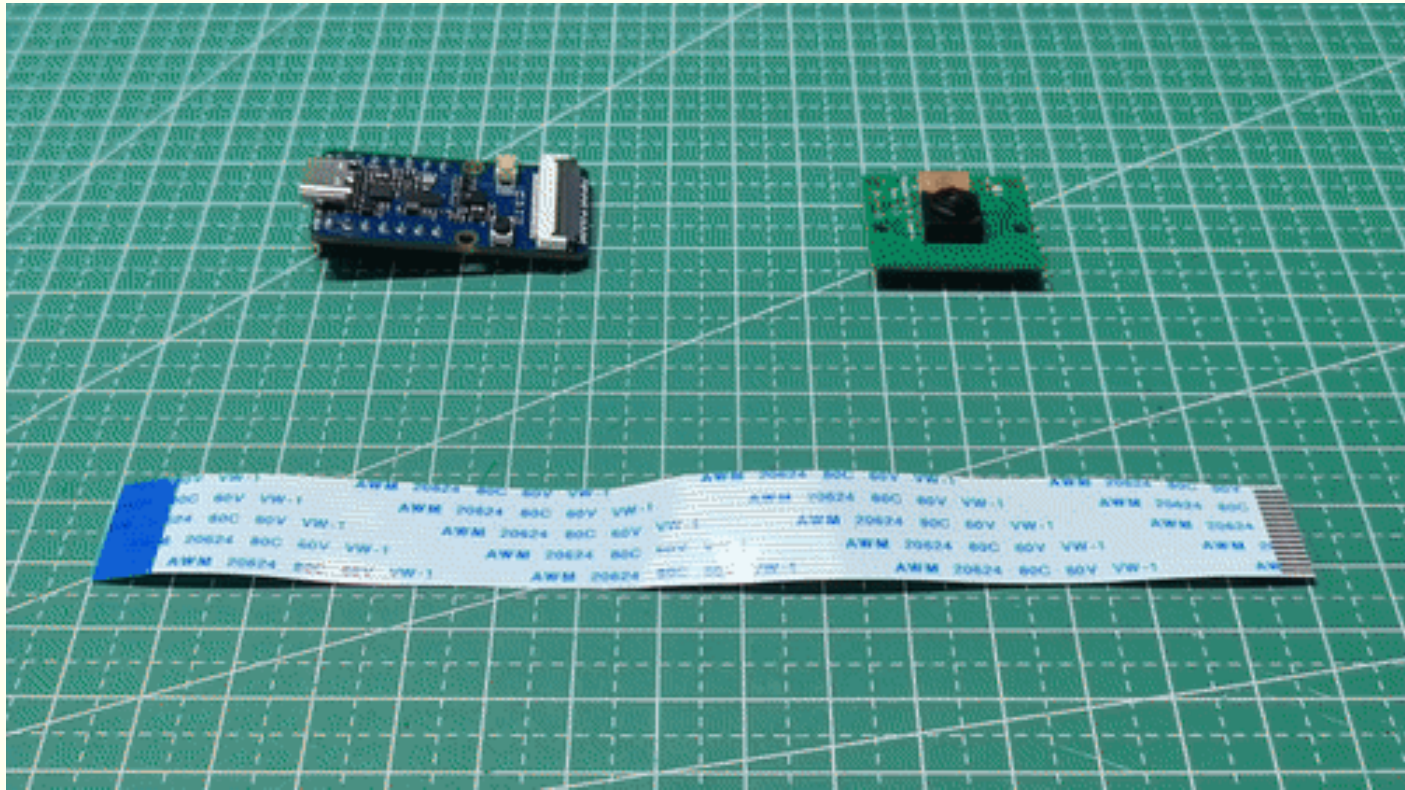
Hardware Overview

- Himax WiseEye2 (WE2) board kit



Hardware Overview

- Himax WiseEye2 (WE2) board kit connect with camera sensor



Hands-on: Himax AI & Seeed Sensecraft AI

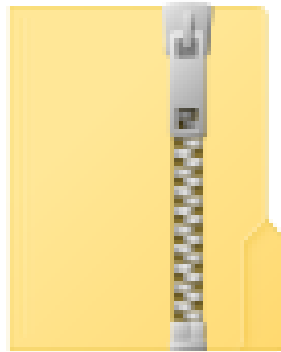


Pre-Requirement

- Download Himax AI Toolkit
- Install CH343 driver

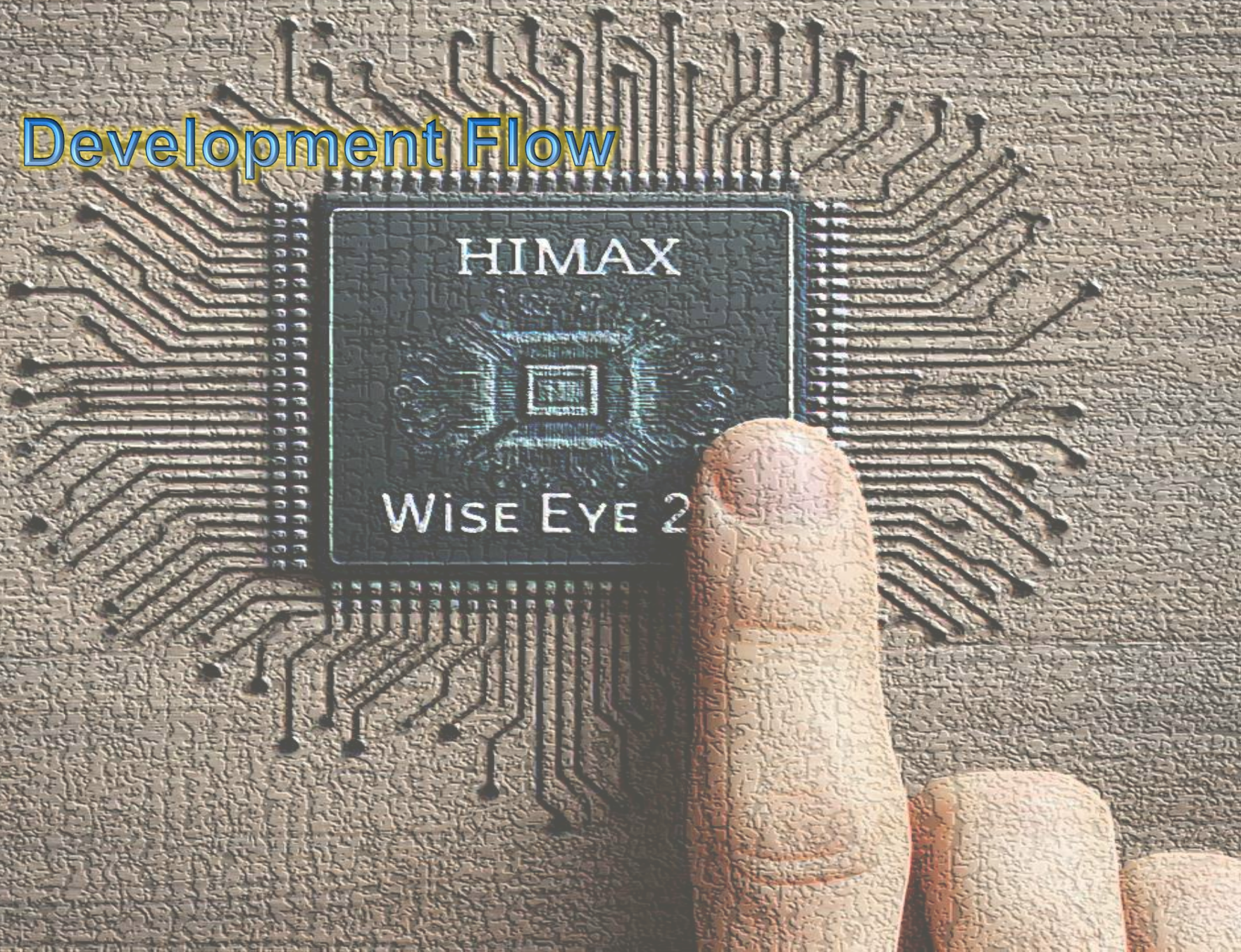


CH343SER.EXE



Himax_AI_web_t
oolkit.zip

Development Flow



Global Development Flow

 TensorFlow  PyTorch

onnx2tf tool:

<https://github.com/PINTO0309/onnx2tf>

TinyNN:

<https://github.com/alibaba/TinyNeuralNetwork>

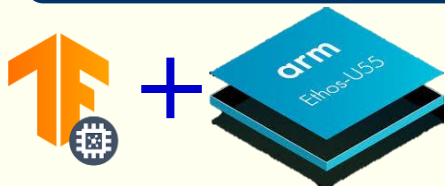
Model Optimization (Quantization) to int8 tflite



TensorFlow Lite
(int8 .tflite format)

Use python tflite interpreter
to check int8 tflite inference result

Pass Vela Compiler



int8 vela model
(int8 .tflite format with ethosu operator)

Use FVP (Fixed Virtual Platforms)
to check int8 vela tflite inference result

**Build firmware(FW) &
Flash FW and vela model to WiseEye2**

Build Firmware

- WiseEye2 Firmware Development Flow

Use Himax SDK API for C or C++ to program

make tool & Arm GNU Toolchain

Use Himax image gen tool to generate img file

Program Code

Compile Project

Create .elf file

Generate .img file

[https://github.com/HimaxWiseEyePlus/Seeed Grove Vision AI Module V2?tab=readme-ov-file#build-the-firmware-at-linux-environment](https://github.com/HimaxWiseEyePlus/Seeed-Grove-Vision-AI-Module-V2?tab=readme-ov-file#build-the-firmware-at-linux-environment)

Program Code



Third-party library

arm CMSIS-CV

arm CMSIS-DSP

M-profile
Vector
Extension
(MVE)



Himax SDK

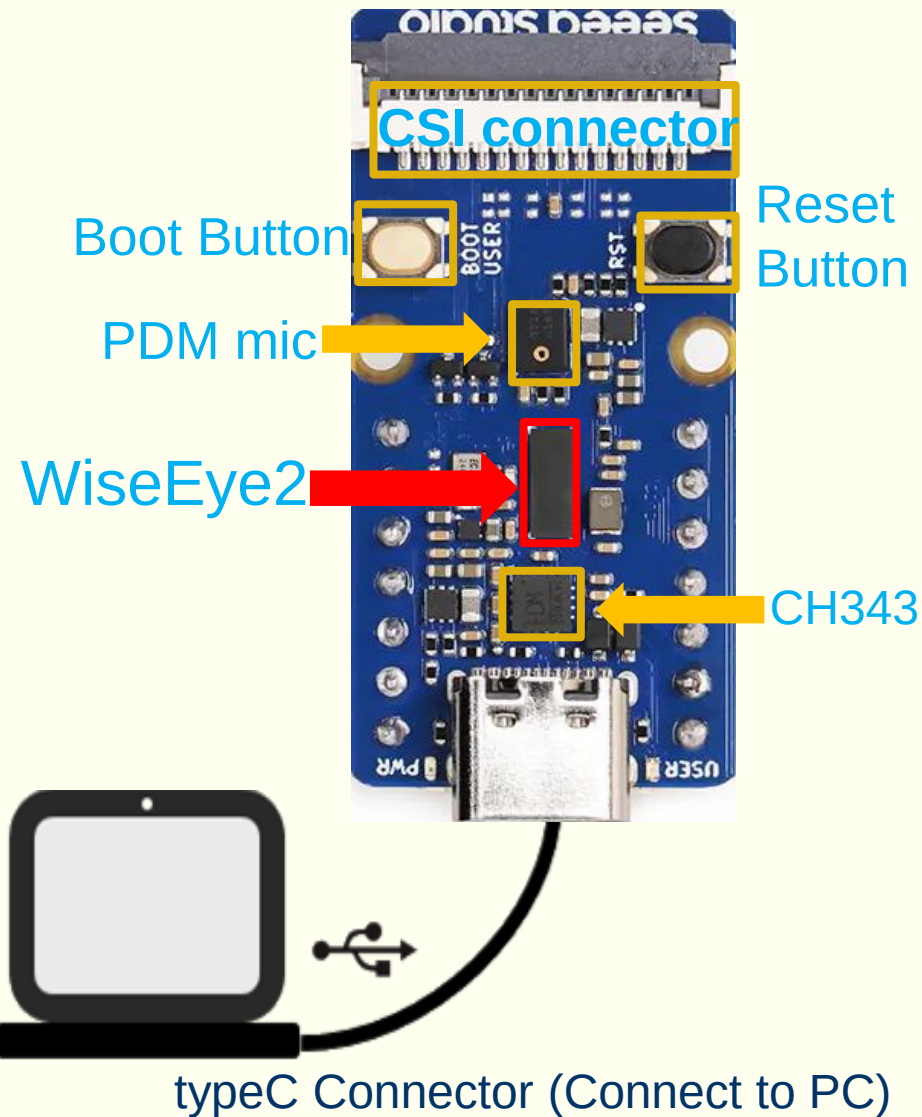
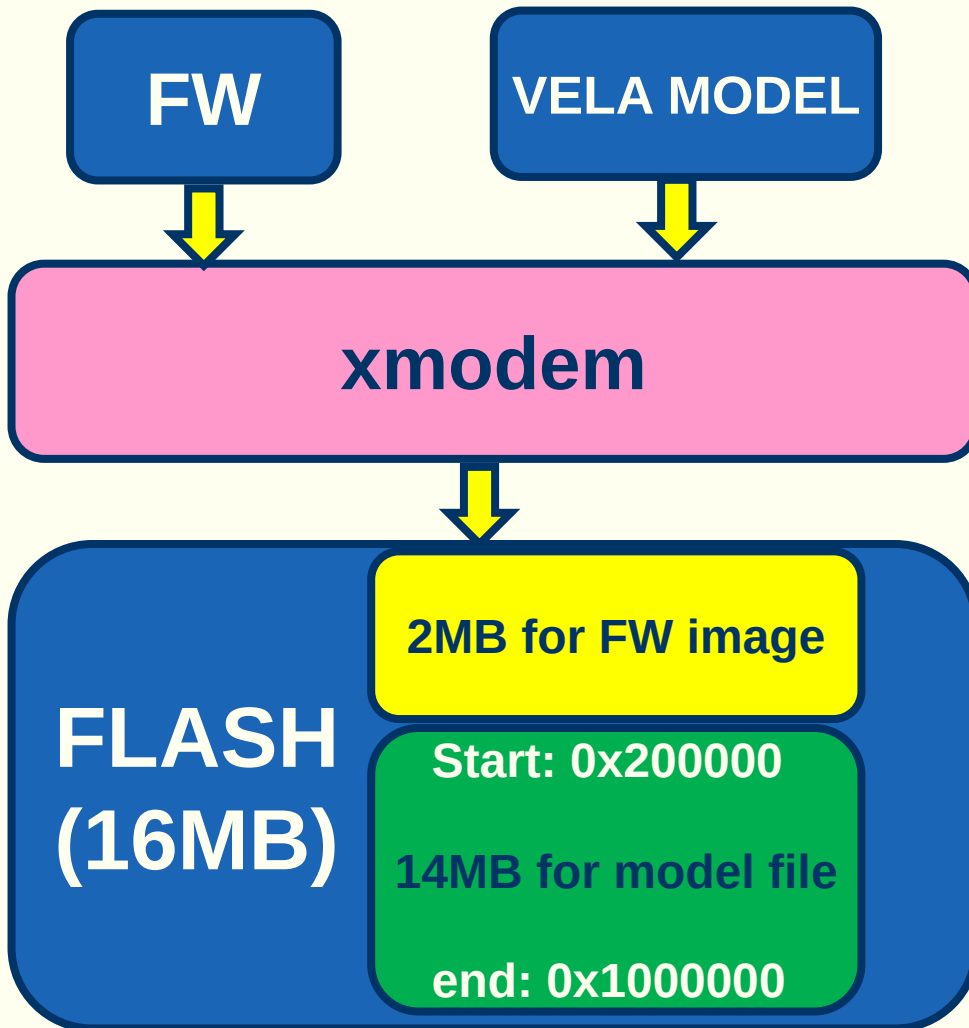


+
TensorFlow Lite
for microcontroller



Flash FW and vela model to WiseEye2

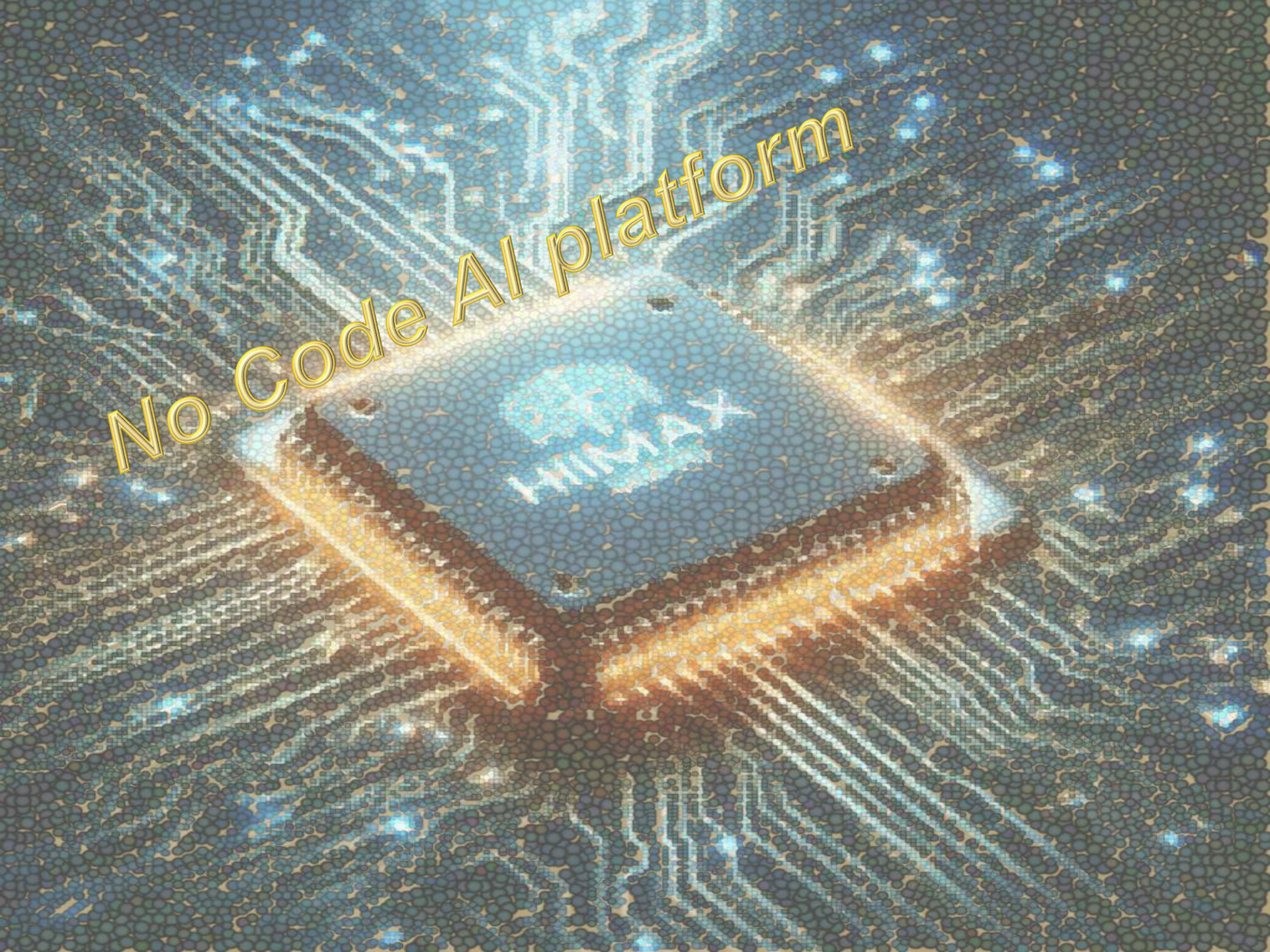
FW should be not
bigger than 1MB



How to build your own project

- For more information you can reference Himax Official GitHub
 - ❖ https://github.com/HimaxWiseEyePlus/Seed_Grove_Vision_AI_Module_V2

scenario_app	project name
face mesh	tflm_fd_fm
yolov8n object detection	tflm_yolov8_od
yolov8n pose	tflm_yolov8_pose
pdm mic record	pdm_record
KeyWord Spotting using Transformers	kws_pdm_record
imu read	imu_read
peoplenet from TAO	tflm_peoplenet



No Code AI platform

No Code AI platform

- Seeed SenseCraft AI
 - ❖ Local Device - SenseCraft AI (seeed.cc)

SenseCraft | SenseCraft AI Home AI Models Device Workspace limengdu

Please input model name

13 Models Clear

Task

Detection Classification Segment Pose

Supported Devices

Vision AI reComputer Jetson XIAO

Publisher

SenseCraft AI tengxun001@seeed.cc

013@seeed.cc

Public AI Models Custom AI Models + Add Model



Sheep_Counting
Sheep_Counting

Detection reComputer Jetson YOLOV8

tengxun001@seeed.cc



Sheep Detection

Detection reComputer Jetson YOLOV8

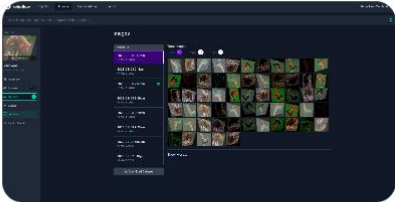
tengxun001@seeed.cc



detentions model tensorrt
detentions model tensorrt

Detection reComputer Jetson YOLOV8

tengxun001@seeed.cc



Chicken health detection
Detect Healthy or Sick chicken

Detection reComputer Jetson YOLOV8



Mini-GPT4
Give your locally running LLM an access to vision, by running MiniGPT-4 on Jetson!

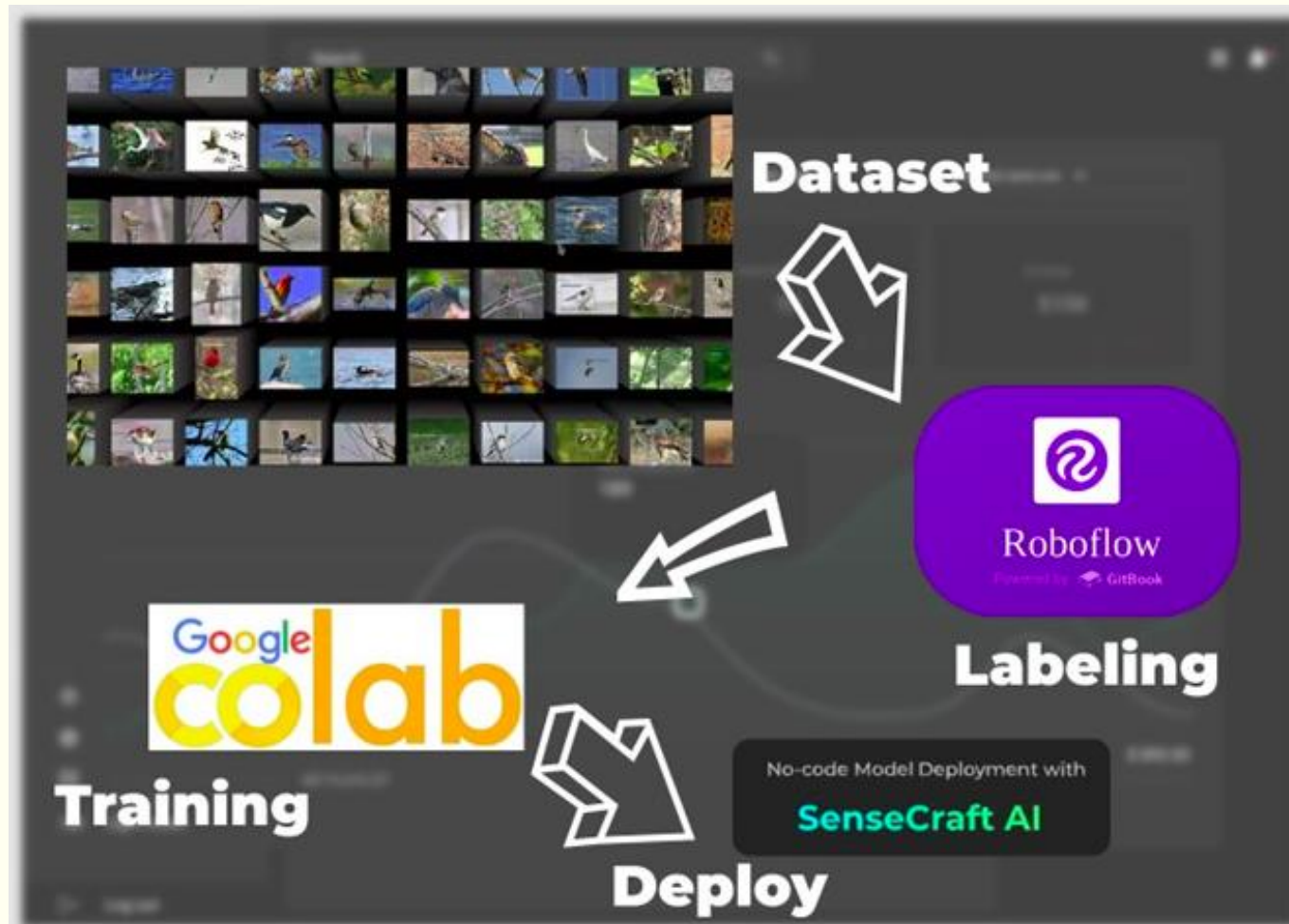


Emotion Classification
Let machines read human emotions

Classification XIAO YOLOV5

No Code AI platform

- Seeed SenseCraft AI
 - ❖ [Quick Start | Seeed Studio Wiki](#)



No Code AI platform

- Edge Impulse

- ❖ <https://docs.edgeimpulse.com/docs/edge-ai-hardware/mcu+-ai-accelerators/himax-seeed-grove-vision-ai-module-v2-wise-eye-2>

The screenshot displays the Edge Impulse web interface. On the left is a sidebar with navigation options: Dashboard, Devices, Data acquisition, Experiments, and Impulse design (selected). Under 'Impulse design', there are links for 'Create impulse', 'Image', 'Object detection', 'Retrain model', 'Live classification', 'Model testing', and 'Deployment'. The main area is titled 'Impulse #1' and contains a description: 'An impulse takes raw data, uses signal processing to extract features, and then uses a learning block to classify new data.' Below this, the workflow is visualized with four colored blocks: 1. 'Image data' (red) with input axes 'Image' (width 96, height 96) and a 'Resize mode' dropdown set to 'Fit'. 2. 'Image' (white) with name 'Image' and input axes 'Image'. 3. 'Object Detection (Images)' (purple) with name 'Object detection', input features checked for 'Image', and output features '1 (person)'. 4. 'Output features' (green) showing '1 (person)' and a 'Save Impulse' button. A help icon is visible in the bottom right corner.

No Code AI platform

● Edge Impulse



- Dashboard
- Devices
- Data acquisition
- Experiments
- Impulse design
 - Create impulse
 - Image
 - Object detection
 - Retrain model
 - Live classification
 - Model testing
 - Deployment
- Versioning
- GETTING STARTED
 - Documentation
 - Forums

Himax / testtt ENTERPRISE

Target: Himax WiseEye2 ...

Dataset

Data sources

Synthetic data

Labeling queue (1)

Auto-labeler

DATA COLLECTED

333 items

TRAIN / TEST SPLIT

80% / 20%

Collect data

Connect a device to start building your dataset.

Dataset

Training (265) Test (68)

SAMPLE NAME	LABELS	ADDED
sample.53tt7tvb	person	7月 30日 2024年, 15:...
sample.53tl94kr	person	7月 30日 2024年, 13:...
Skype_Video.s985	person	7月 01日 2024年, 14:...
Skype_Video.s982	person, person, pers...	7月 01日 2024年, 14:...
Skype_Video.s979	person, person	7月 01日 2024年, 14:...
Skype_Video.s976	person, person	7月 01日 2024年, 14:...
Skype_Video.s970	person, person, pers...	7月 01日 2024年, 14:...
Skype_Video.s967	person, person, pers...	7月 01日 2024年, 14:...
Skype_Video.s964	person, person, pers...	7月 01日 2024年, 14:...
Skype_Video.s961	person, person, pers...	7月 01日 2024年, 14:...
Skype_Video.s955	person, person, pers...	7月 01日 2024年, 14:...
Skype_Video.s952	person, person, pers...	7月 01日 2024年, 14:...

RAW DATA

sample.53tt7tvb

Metadata

No metadata.

No Code AI platform

- Ultralytics Hub (Yolov8)

- ❖ <https://hub.ultralytics.com/>

- ❖ https://github.com/HimaxWiseEyePlus/YOLOv8_on_WE2

The screenshot displays the Ultralytics HUB Beta web interface. On the left is a dark sidebar with navigation links: Home, Datasets, Projects, Models, Integrations, Support, and Trash. The main content area is titled 'Home' and features a 'Get Started' section with a 'Start Welcome Tutorial' button and an image of a person wearing a safety helmet. Below this are three columns: 'Datasets' (with an 'Upload Dataset' button), 'Projects' (with a 'Create Project' button), and 'Models' (with a 'Train Model' button). A 'Recent' section on the right lists three items: 'retail_yolov8n_192_test', 'retail_yolov8n_test', and 'yolov8n_640_traffic_v2'. At the bottom right is a user profile card for 'kris' with a storage usage bar (702.8 MB / 20.0 GB), a 'Current plan' of 'FREE', an 'Upgrade' button, and a 'Sign Out' link. The bottom left shows a user profile for 'kris' with a 'FREE' status.



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