

# GR-MANGO AI GUIDE

Let's challenge next step!

# Introduction

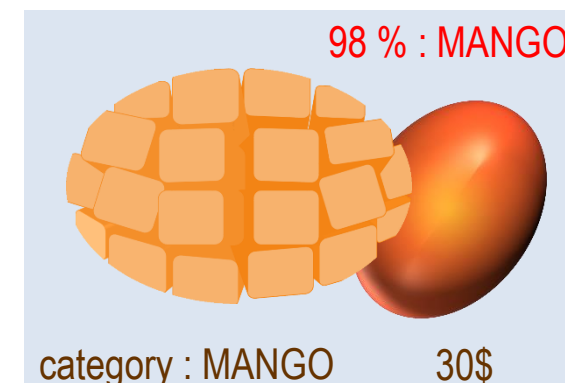
"I want to do AI using color images!"

"I tried AI with the e-AI starting package. But I'm not sure what to do when changing to my favorite image..."

We have prepared a sample package for you to try the color image AI, and change it to your favorite food images for your next step!

We will explain about food menu recognition using AI on Renesas GR-MANGO(with RZ/A2M) board.

In conducting trials and development, we ask customers to collect AI learning data and create an AI learning environment. Please note that we do not support AI learning itself.



# ATTENTION

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This package includes the open source TFLM (TensorFlow Lite for Microcontrollers) provided by Google.

There are several types, we selected "Post training integer quantized".

## ATTENTION

TFLM is the code of **Apache License 2.0**. If you use this package for purposes other than training (commercial use), please check the contents of the license.

TFLM has a lot of manuals on the official website.

[TensorFlow Lite for Microcontrollers](#)

[Build and convert models | TensorFlow Lite](#)

# TOC

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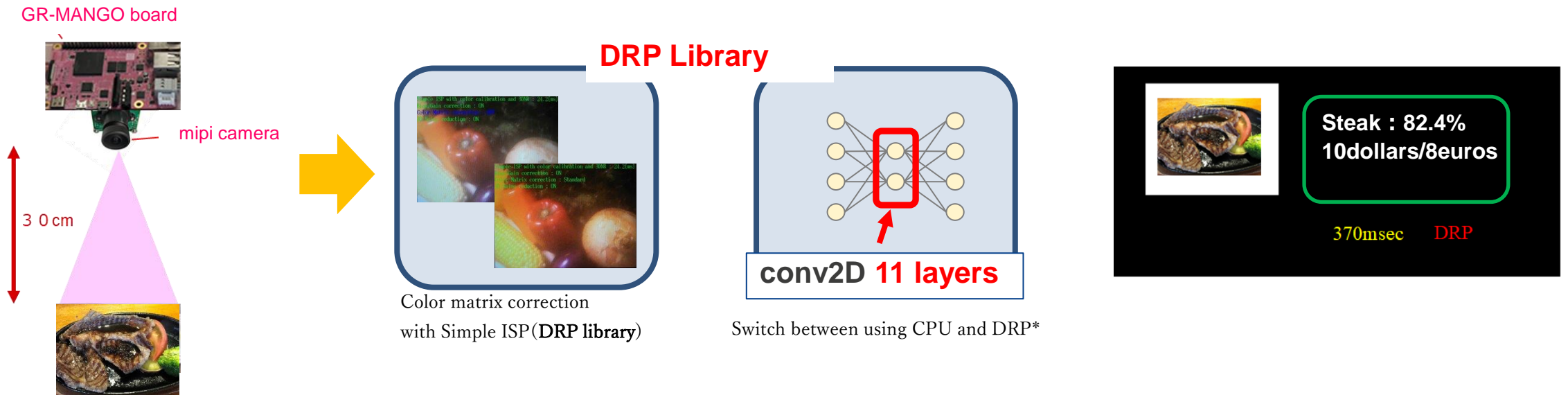
# DEMONSTRATIONS(FOOD MENU RECOGNITION)



- Execute image preprocessing (capturing data) with DRP
- Execute CNN (convolution 2D) with DRP
- Learn CNN framework TensorFlow Lite / Keras, convert with command.

# Outline of this guide

## 1. Shooting food menu 2. AI preprocessing 3. AI executing 4. Recognition of food menu



Note: If the CNN parameters are supported by the DRP library, it can be processed 5 to 7 times faster than the CPU.  
For details, refer to APPENDIX in "AI Customization Guide with GR-MANGO".



# Things to prepare

## ✓ Package contents



### Documents ..... 3

- 0.GR-MANGO\_AI\_guide.pdf(this document)
- 1.GR-MANGO\_AI\_beginner's\_guide.pdf
- 2.GR-MANGO\_AI\_customization\_guide.pdf



GR-MANGO\_food\_menu\_recognition.zip

CNN\_food\_menu\_recognition.zip

### Program packages... 2

GR-MANGO\_food\_menu\_recognition.zip

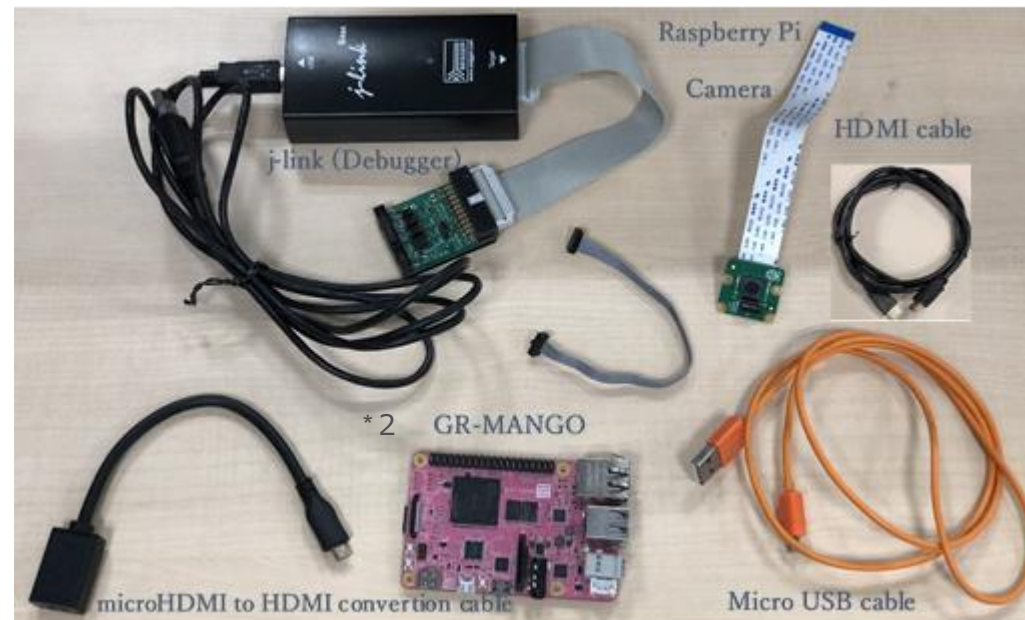
Set of e<sup>2</sup>studio environments for food menu recognition

CNN\_food\_menu\_recognition.zip

Set of AI learning environments for food menu recognition

Note 1 Please prepare a PC with internet connection and free space of 6G or more.

## ✓ Hardware to prepare



Windows10 PC 64bit



\* 1

Note2

URL  
to order

[USA](#) [UK](#) [Germany](#) [China](#) [Hong Kong](#)  
[Taiwan](#) [Singapore](#) [Japan](#)

# Confirmation environment list (1 of 2)

Contents	Version	Note
Programming language <Python>	3.5.3	Used for AI learning
Library for AI Learning <Keras>	2.2.4	Used for AI learning
Library for AI Learning <Tensorflow>	2.0.1	Used for AI learning
Library for Python <progressBar>	2.4	Used for AI learning
Library for Python <prettytable>	0.7.2	Used for AI learning
Library for Python <imageio>	2.6.1	Used for AI learning
Library for Python <matplotlib>	3.0.3	Used for AI learning

Note: Operation and AI learning accuracy is not guaranteed. Please note that we can not accept questions in an unlisted environment.



# Confirmation environment list (2 of 2)

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Contents	Version	Note
Microsoft Windows10 Enterprise	1803	Used for AI learning and compiling of inference execution
e2 studio integrated development environment	7.8.0	Used for compiling of inference execution
Python script for AI learning <food menu recognition.py>	1.0	Included RZ/A e-AI next step package

Note: Operation and AI learning accuracy is not guaranteed. Please note that we can not accept questions in an unlisted environment.

# STEP

## Part. 1 Let's recognize food menu using AI on GR-MANGO board

### First, try with a trained model

We prepared trained AI model for food menu recognition in 15 categories.

1. Download to GR-MANGO using e2studio.
2. After that, we will execute inference.



## Part. 2 Let's recognize favorite food menu using AI on GR-MANGO board

### Next, customize to your favorite food menu

1. Change the image of the food menu and create a new AI model.
2. Download to GR-MANGO using e<sup>2</sup>studio.
3. After that, we will execute inference.



# Revision history

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Ver 1.00   Dec 2020   Updated

[www.renesas.com](http://www.renesas.com)