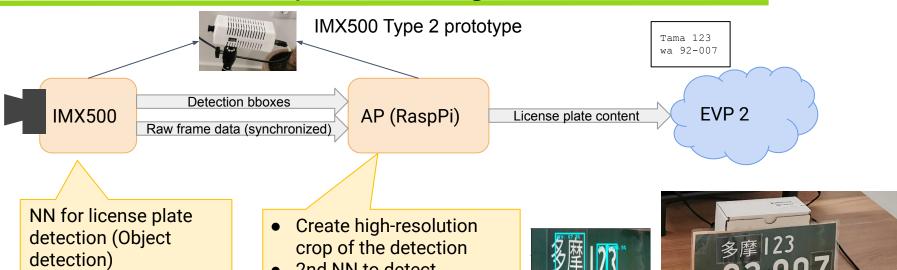
WASI-NN at Midokura

2024.08.05



Use case - License plate reading





- 2nd NN to detect characters/numbers of license plate (in tf-lite runtime)
- Read license plate content from character detections





Note: mistake in the second line of the license plate - second group should be only two numbers. Updated in demo.

License plate recognition

ISP Licen

License plate detection

Standard bboxes

Prepare image for 2nd NN

License plate char detection

License plate reading Send Informat ion Further processing on cloud

ISP

- Transformation of image sensor output to Neural network input
- Image resized to network input 300x300

DNN Execution

- Object-detection network run on the IMX500 to detect the locations of the license plates
- Output: heatmaps or bounding boxes in any format

Required Artifacts

- NN as packaged and encrypted module
- ISP setting for resizing and normalization

Postprocess NN output

 Convert device-specific output to bounding boxes, classes and scores in standard format

Required Artifacts

- Postprocessing of NN in Wasm form
- If multi-class, knowledge of which output class is which type of license plate (output configuration of NN)

Postprocess IMX500 raw data

- Convert raw image to full-resoluti on RGB
 Crop image
 - to obtain the patches correspondi ng to license plate detections
- Resize to LPR NN input size

Required Artifacts

 Input size of LPR NN

Detect the locations of the characters & digits in the license plate

- Object detection network run in a TFLite runtime
- Has to be run more than once if more than one license plate has to be read

Postprocess NN output

 Convert TFLite runtime output to bounding boxes, classes and scores in standard format

Required Artifacts

- NN in TFlite form to perform License plate character detection (object detection)
- Wasm binary that calls the TFLite runtime

Create the final number plate reading

 Based on location of the detected digits, create the final number plate reading

Required Artifacts

 Knowledge of the LPR NN output format, which character is which output class

Module for communicatin g with the cloud / EVP

 Send information to the cloud or to EVP

SettingWhich

Required

- information to send (meta-data or also raw image)
- Where to send the information to

External (user) system processes the events