Edge Intelligence Lab-5- 10.01.2026

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Phase 2: Impulse Design, Feature Extraction, and Model Training Steps

1. **Select Create Impulse**
   - Click Create Impulse after navigating to the Impulse Design area.
   - Choose Image under Add Processing Block.
   - Select Transfer Learning (Images) under Add Learning Block.
   - To increase accuracy and shorten training times, transfer learning makes use of a pre-trained model.

2. **Choose Save Impulse**
   - Click Save Impulse once the blocks have been chosen. This sets up the data flow and gets the project ready for feature extraction.

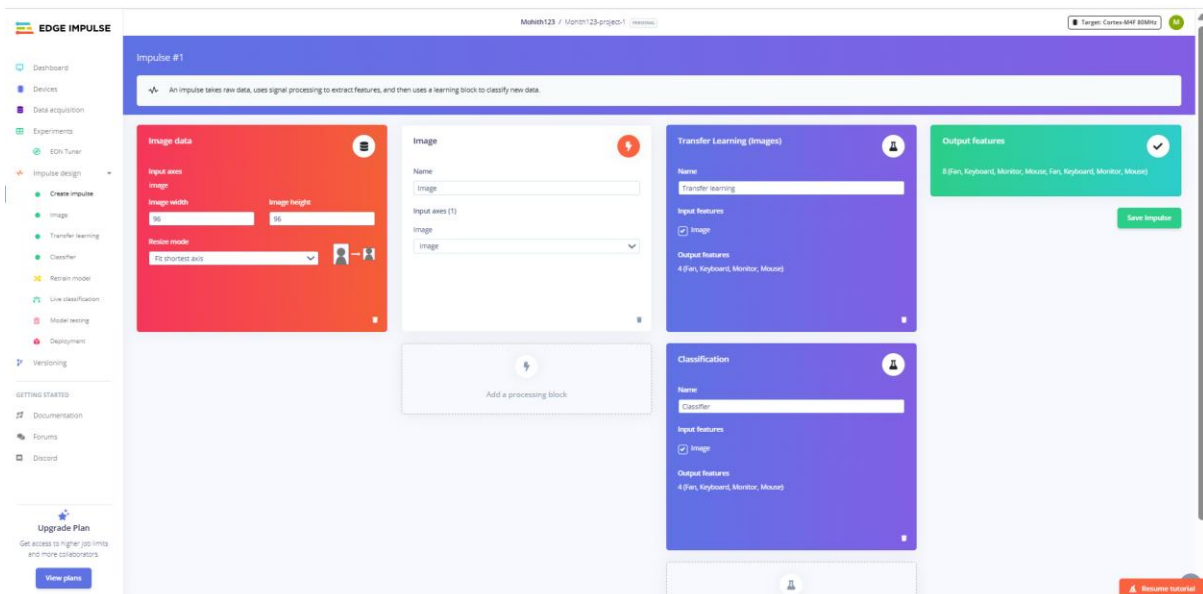3. **Create Features from Pictures**
   - Click on Generate Features after selecting the Generate Features tab under Impulse Design's Image option.
   - In this stage, unprocessed photos are transformed into characteristics that the machine learning model can comprehend.

4. **Develop the Model and Obtain Precision**
   - To save and train, click. Using the features that were collected, Edge Impulse will train the model and present performance metrics, loss graphs, and training and validation accuracy.

Screenshots:

Transfer Learning

Screen 1

Parameters   Generate features

Raw data   Show: All labels   Fan.6ebbtibi (Fan)

Raw features

0x727471, 0x737574, 0x747675, 0x757978, 0x787d7c, 0x7d8181, 0x7d8186, 0x888589, 0x81808d, 0x838d53, 0x8d9296, 0x8994fb, 0x8a9b9f, 0x8d9aa2, 0x8f9eab, 0x91a1ae,

Parameters

Image

Color depth ⑦   RGB

Save parameters

DSP result

Image

Processed features ⑦

0.4471, 0.4569, 0.4510, 0.4518, 0.4588, 0.4546, 0.4569, 0.4627, 0.4596, 0.4588, 0.4745, 0.4781, 0.4746, 0.4902, 0.4902, 0.4902, 0.5059, 0.5137, 0.4941, 0.5059,

On-device performance ⑦

PROCESSING TIME   7 ms.   PEAK RAM USAGE   4 KB

Resume tutorial

Screen 2

Parameters   Generate features

Training set

Data in training set   16 items
Classes   4 (Fan, Keyboard, Monitor, Mouse)
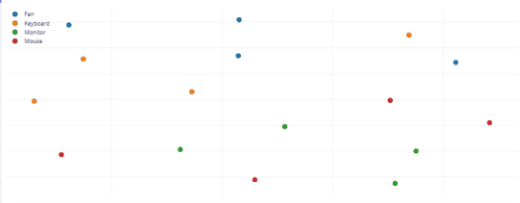
Generate features

Feature generation output

Feature explorer

- Fan
- Keyboard
- Monitor
- Mouse

On-device performance ⑦

PROCESSING TIME   7 ms.   PEAK RAM USAGE   4 KB

Screen 3

Neural Network settings

Training settings

Number of training cycles ⑦   20
Use learned optimizer ⑦
Learning rate ⑦   0.0005
Training processor ⑦   CPU
Data augmentation ⑦

Advanced training settings

Neural network architecture

Input layer (27,648 features)

MobileNetV2 96x96 0.35 (final layer: 16 neurons, 0.1 dropout)

Choose a different model

Output layer (4 classes)

Save & train

Training output

Model   Model version: Quantized (int8)

Last training performance (validation set)

ACCURACY   75.0%   LOSS   0.58

Confusion matrix (validation set)

	FAN	KEYBOARD	MONITOR	MOUSE
FAN	100%	0%	0%	0%
KEYBOARD				
MONITOR	0%	0%	100%	0%
MOUSE	0%	0%	50%	50%
F1 SCORE	1.00		0.67	0.67

Metrics (validation set)

METRIC	VALUE
Weighted average Precision ⑦	0.88
Weighted average Recall ⑦	0.75
Weighted average F1 score ⑦	0.75

Data explorer (full training set) ⑦

- Fan - correct
- Keyboard - correct
- Monitor - correct
- Mouse - correct
- Fan - incorrect
- Mouse - incorrect

On-device performance ⑦   Engine: EON™ Compiler (RAM optimized)

INFERENCING TIME   PEAK RAM USAGE   FLASH USAGE

Resume tutorial

Sidebar navigation (all screens):

Dashboard, Devices, Data acquisition, Experiments, EON Tuner, Impulse design, Create impulse, Image, Transfer learning, Classifier, Retrain model, Live classification, Model testing, Deployment, Versioning

GETTING STARTED: Documentation, Forums, Discord

Training output 🔕 (0) ▾

Model Model version: ⓘ [Quantized (int8) ▾]

Last training performance (validation set)

% **ACCURACY** 75.0%   📈 **LOSS** 0.58

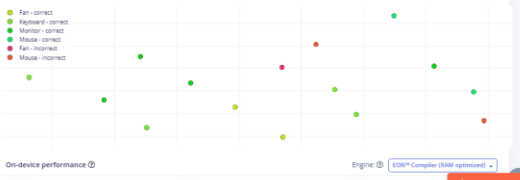**Confusion matrix** (validation set)

	FAN	KEYBOARD	MONITOR	MOUSE
FAN	100%	0%	0%	0%
KEYBOARD	–	–		–
MONITOR	0%	0%	100%	0%
MOUSE	0%	0%	50%	50%
F1 SCORE	1.00		0.67	0.67

Metrics (validation set)

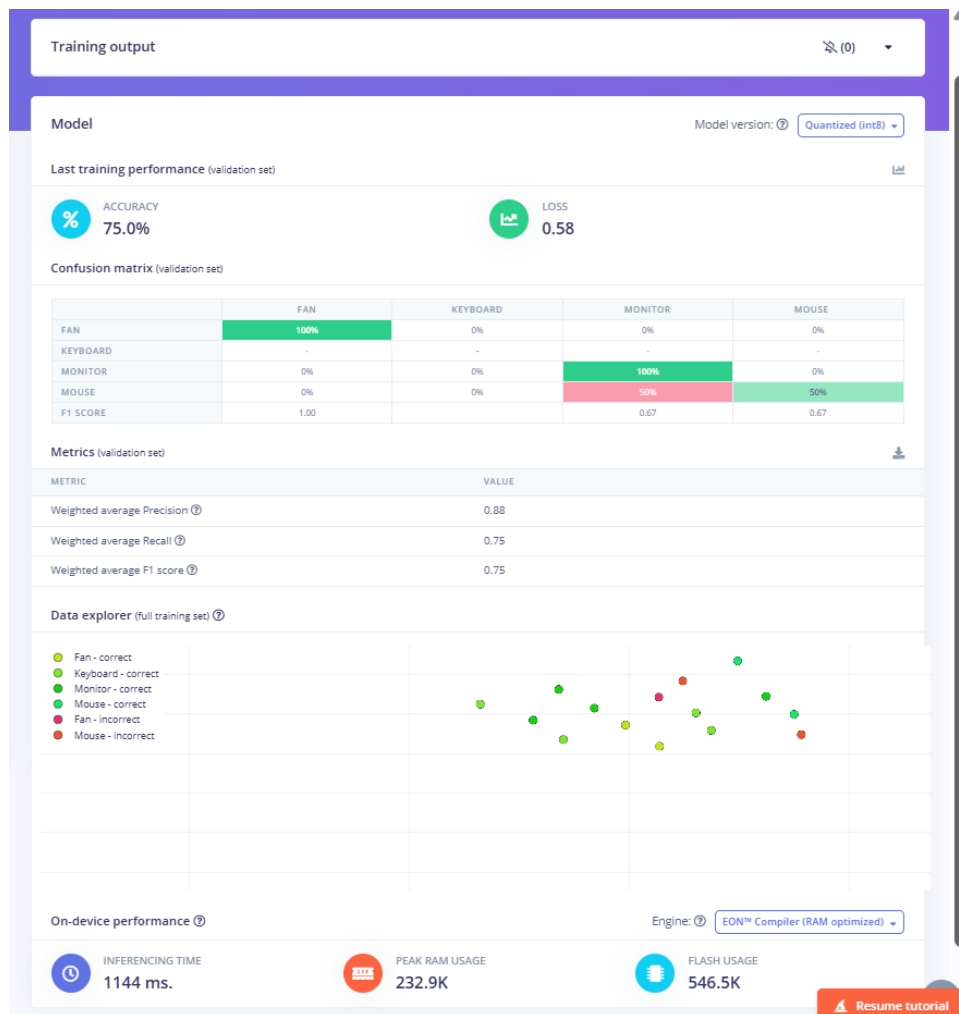| METRIC	VALUE
Weighted average Precision ⓘ	0.88
Weighted average Recall ⓘ	0.75
Weighted average F1 score ⓘ	0.75

Data explorer (full training set) ⓘ

- Fan - correct
- Keyboard - correct
- Monitor - correct
- Mouse - correct
- Fan - incorrect
- Mouse - incorrect

On-device performance ⓘ   Engine: ⓘ [EON™ Compiler (RAM optimized) ▾]

🕐 **INFERENCING TIME** 1144 ms.   **PEAK RAM USAGE** 232.9K   **FLASH USAGE** 546.5K

⚠ Resume tutorial

Classifier:
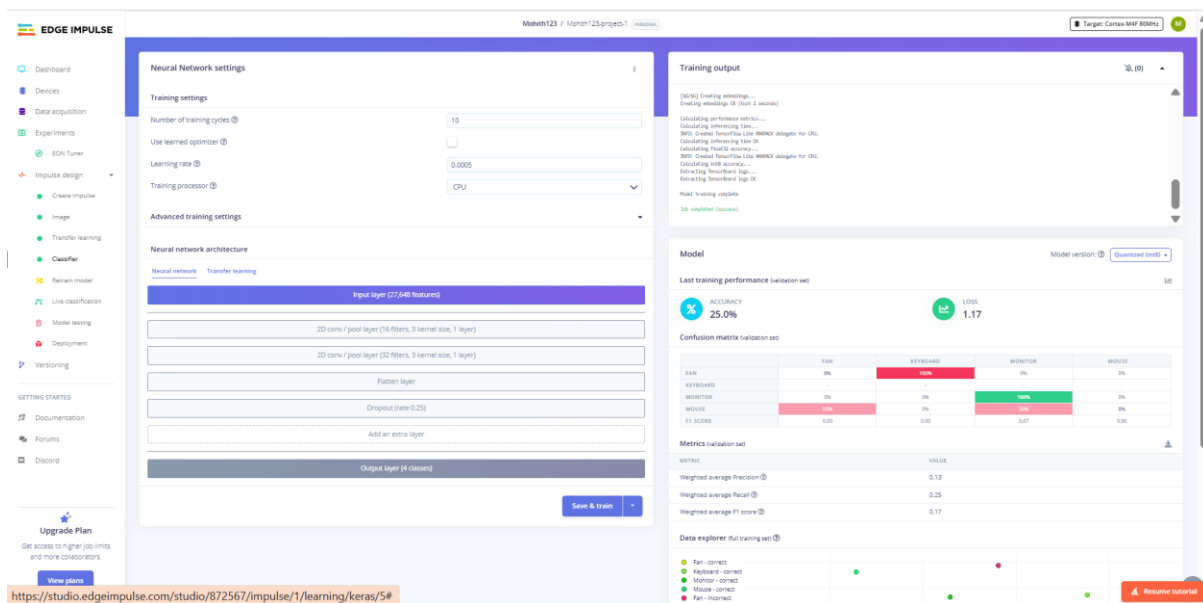
Model

Model version: ⑦ [Quantized (int8) ▾]

Last training performance (validation set)   📊

	ACCURACY		LOSS
%	25.0%	📈	1.17

Confusion matrix (validation set)

Error: 0% (0 / 1)
Actual label: Fan
Predicted label: Monitor

	FAN	KEYBOARD	MONITOR	MOUSE
FAN	0%	100%	0%	0%
KEYBOARD	-	-	-	-
MONITOR	0%	0%	100%	0%
MOUSE	50%	0%	50%	0%
F1 SCORE	0.00	0.00	0.67	0.00

Metrics (validation set)   ⬇

METRIC	VALUE
Weighted average Precision ⑦	0.13
Weighted average Recall ⑦	0.25
Weighted average F1 score ⑦	0.17

Data explorer (full training set) ⑦

- Fan - correct
- Keyboard - correct
- Monitor - correct
- Mouse - correct
- Fan - incorrect
- Mouse - incorrect

On-device performance ⑦   Engine: [EON™ Compiler ▾]

	INFERENCING TIME		PEAK RAM USAGE		FLASH USAGE
🕐	585 ms.	▦	182.8K	💾	106.4K

[🔥 Resume tutorial]