

# EDGE INTELLIGENCE LAB

P SUSHMA

25MML0050

The data is split into an 80:20 ratio for training and testing.

The screenshot shows the Edge Impulse web interface for managing datasets. On the left, a sidebar menu includes options like Dashboard, Devices, Data acquisition, Experiments, EON Tuner, Impulse design (selected), Create impulse, Image, Classification, Transfer learning, and Upgrade Plan. The main area displays a dataset titled "sushma0208 / sushma0208-project-1 [PERSONAL]". It shows "DATA COLLECTED 20 items" and a pie chart indicating an 80% / 20% TRAIN / TEST SPLIT. A "Collect data" section with a "Connect a device" button is present. Below is a table of dataset samples:

SAMPLE NAME	LABEL	ADDED
Chair.6ebc1csj	Chair	Jan 08 2026, 17...
Chair.6ebbvr1k	Chair	Jan 08 2026, 17...
Chair.6ebbvnf1	Chair	Jan 08 2026, 17...
Keyboard.6ebbrkfc	Keyboard	Jan 08 2026, 17...
Keyboard.6ebbrej9	Keyboard	Jan 08 2026, 17...
Keyboard.6ebbrach	Keyboard	Jan 08 2026, 17...
Desktop.6ebbpkj0	Desktop	Jan 08 2026, 17...
Dataset.6ebbh2o4	Desktop	Jan 08 2026, 17...

A dark banner at the bottom says "Click on a sample to load...". A red "Resume tutorial" button is in the bottom right.

Create impulse by adding image block and classification block.

The screenshot shows the Edge Impulse web interface for creating an impulse. The left sidebar is identical to the previous screenshot. The main area is titled "Impulse #1" and contains four blocks: "Image data", "Image", "Classification", and "Output features".

- Image data:** Set to "image" with "Input axes" as "image", "Image width" and "Image height" both set to 96, and "Resize mode" set to "Fit shortest".
- Image:** A block with a lightning bolt icon, labeled "Name: Image".
- Classification:** A block with a microscope icon, labeled "Name: Classification". Under "Input features", "Image" is selected. Under "Output features", it lists 4 categories: Chair, Desktop, Keyboard, Mouse.
- Output features:** A green block labeled "8 (Chair, Desktop, Keyboard, Mouse, Chair, Desktop, Keyboard, Mouse)".

A green "Save impulse" button is located at the bottom right.

## Save the parameters and generate features

The screenshot shows the Edge Impulse web interface for a project titled "sushma0208 / sushma0208-project-1". The left sidebar includes options like Dashboard, Devices, Data acquisition, Experiments, EON Tuner, Impulse design (with sub-options Create impulse, Image, Classification, Transfer learning), and a prominent Upgrade Plan section. The main area has tabs for "Parameters" and "Generate features". Under "Raw data", there's a preview of a chair image and filters for "All labels" and "Chair.6ebc1csj (Chair)". The "Raw features" section shows a list of feature values: 0x90402, 0xa0404, 0xb0706, 0x30101, 0x1a1a1d, 0x1e1d22, 0x1c1a1c, 0x201d1f, 0x26... Below it, the "Parameters" section for "Image" includes a "Color depth" dropdown set to "RGB". The "DSP result" section displays an "Image" of the chair and a "Processed features" list with values starting from 0.0353, 0.0157, 0.0078, 0.0392, 0.0157, 0.0157, 0.0431, 0.0275, 0.0235, 0.0118, ... A "Save parameters" button is at the bottom. A "Resume tutorial" button is also visible.

This screenshot shows the Edge Impulse interface after generating features. The "Training set" section indicates 16 items and 4 classes: Chair, Desktop, Keyboard, and Mouse. The "Feature generation output" section shows a dropdown menu with "(0)" selected. To the right, the "Feature explorer" section displays a scatter plot with four data series: Chair (blue dots), Desktop (orange dots), Keyboard (green dots), and Mouse (red dots). The x-axis and y-axis are unlabeled. Below the plot, the "On-device performance" section includes "PROCESSING TIME" and "PEAK RAM" metrics, both represented by small colored bars. A "Resume tutorial" button is located at the bottom right.

## Save and train the network and get the classification accuracy

**EDGE IMPULSE**

- Dashboard
- Devices
- Data acquisition
- Experiments
  - EON Tuner
- Impulse design
  - Create impulse
  - Image
  - Classification
  - Transfer learning
  - Machine model
- Upgrade Plan

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sushma0208 / sushma0208-project-1 PERSONAL Target: Cortex-M4F 80MHz 5

### Neural Network settings

#### Training settings

Number of training cycles: 10

Use learned optimizer:

Learning rate: 0.0005

Training processor: CPU

#### Advanced training settings

#### Neural network architecture

Neural network Transfer learning

Input layer (27,648 features)

2D conv / pool layer (16 filters, 3 kernel size, 1 layer)

2D conv / pool layer (32 filters, 3 kernel size, 1 layer)

Flatten layer

### Training output

#### Model

Model version: Quantized (int8)

#### Last training performance (validation set)

	CHAIR	DESKTOP	KEYBOARD	MOUSE
CHAIR	100%	0%	0%	0%
DESKTOP	0%	100%	0%	0%
KEYBOARD	50%	0%	50%	0%
MOUSE	-	-	-	-
F1 SCORE	0.67	1.00	0.67	-

#### Metrics (validation set)

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

[Resume tutorial](#)

**EDGE IMPULSE**

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2D conv / pool layer (16 filters, 3 kernel size, 1 layer)

2D conv / pool layer (32 filters, 3 kernel size, 1 layer)

Flatten layer

Dropout (rate 0.25)

Add an extra layer

Output layer (4 classes)

[Save & train](#)

### 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)

Legend: Chair - correct (yellow circle), Desktop - correct (green circle), Keyboard - correct (blue circle), Mouse - correct (red circle), Keyboard - incorrect (yellow square).

### On-device performance

Engine: EON™ Compiler

INFERENCE TIME ...	554 ms.
PEAK RAM USA...	182.8K
FLASH USAGE	106.4K

[Resume tutorial](#)

Select the network and do transfer training and get the training performance.

The screenshot shows the Edge Impulse web interface. On the left, a sidebar menu includes options like Dashboard, Devices, Data acquisition, Experiments, EON Tuner, Impulse design (with sub-options Create impulse, Image, Classification, Transfer learning), and a section for the Upgrade Plan. The main area is titled "Neural Network settings". It contains "Training settings" with fields for Number of training cycles (20), Use learned optimizer (unchecked), Learning rate (0.0005), Training processor (CPU), and Data augmentation (unchecked). Below that is an "Advanced training settings" dropdown. Under "Neural network architecture", there's a "Input layer (27,648 features)" section showing a MobileNetV1 96x96 0.25 model (no final dense layer, 0.1 dropout). To the right, a "Training output" panel shows "Model" details (Model version: Quantized (int8)) and "Last training performance" metrics: Accuracy 50.0% and Loss 1.18. It also includes a "Confusion matrix" table and a "Metrics" table. A "Resume tutorial" button is at the bottom right.

This screenshot shows the same Edge Impulse interface but with different content. The "Neural Network settings" section is now collapsed, and the main focus is on the "Input layer (27,648 features)" and "Output layer (4 classes)" sections. The input layer shows a MobileNetV1 96x96 0.25 model. Below it is a "Choose a different model" dropdown. The output layer shows "Save & train" buttons. To the right, the "Metrics" table and "Data explorer" chart are visible. The "Data explorer" chart plots various data points against each other, with a legend indicating categories like Chair - correct, Desktop - correct, etc. At the bottom, "On-device performance" metrics are shown: INFERENCING ... 493 ms., PEAK RAM USA... 134.2K, and FLASH USAGE 296.1K. A "Resume tutorial" button is at the bottom right.