Studio
Rapidly build custom datasets

Collect

Develop models & algorithms

Test

Validate your model performance

Deploy

Easily deploy on any edge target

Store relevant samples in your cloud

Update device firmware

Fetch new data samples

Capture new samples

Trigger webhook

Fetch new firmware

Capture new samples
<table>
<thead>
<tr>
<th>Purpose</th>
<th>Low-end MCU</th>
<th>High-end MCU</th>
<th>MPU</th>
<th>GPU</th>
<th>NPU</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clock speed</td>
<td>10 MHz - 100 MHz</td>
<td>100 MHz - 500 MHz</td>
<td>500 MHz - 6 GHz</td>
<td>500 MHz - 3 GHz</td>
<td>100 MHz - 2 GHz</td>
</tr>
<tr>
<td>Memory (RAM)</td>
<td>10 kB - 100 kB</td>
<td>100 kB - 10 MB</td>
<td>100 MB - 100 GB</td>
<td>100 MB - 30 GB</td>
<td>20 kB - 30 MB</td>
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<tr>
<td>Time series</td>
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<td>Audio</td>
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<td>Image classification</td>
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<td>Object detection</td>
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</table>
Edge Impulse Studio Tour

studio.edgeimpulse.com/public/82033/live
New features
FOMO-AD

- Unique application of FOMO model
- Perform segmented anomaly detection
- Assembly lines, predictive maintenance
NVIDIA TAO Integration

- Pull models from TAO
- Transfer learning on custom data
- Deploy to any device
Python SDK

- Script parts of Studio
- Integrate with other ML tools
- Features:
  - Profile
  - Deploy
  - Upload data
  - Download data
Projects
AI Toaster

Predicts number of seconds until burnt
Reinforcement Learning

- **Environment**
  - Perform action
- **Interpretation**
  - Reward
- **Observation**
  - Agent
- **Action**
Edge AI: Loop

Environment → Perform action

Interpreter

Observation → Agent

Action → Arduino
Future Efforts: Virtual Simulation

NVIDIA Omniverse

Unity
Magic Wand

Magic wand duel, CMU hackathon
Images courtesy of Bill Nace
Smart HVAC

edgeimpulse.com/blog/if-an-hvac-unit-turns-on-in-a-room-and-there's-no-one-around-to-notice-it-does-it-consume-energy/
Bee Counting

matpalm.com/blog/counting_bees/
Posture Monitoring

...green light

Good posture

Communicating Home

hackster.io/jens-ajisai/gently-communicating-home-using-matter-ca97fb
Smart Recycling Bin

hackster.io/s4muela/ai-audio-classifier-recycle-bin-babe02
Plant Health Monitoring

hackster.io/gatoninja236/determining-a-plant-s-health-with-tinyml-085003
Dog Bark Stopper
Getting Started

“TinyML Cookbook” by Gian Marco Iodice

“Introduction to Embedded Machine Learning” on Coursera

“Tiny Machine Learning” on edX