EON Tuner
AutoML for real-world embedded devices
Hi I’m Jan!

I cofounded **Edge Impulse** in 2019

The place to build embedded Machine Learning models

From engineers (not data scientists!) for engineers

Every step of the way, from data collection to deployment

Already >26,000 real ML projects created!
Signal processing + ML = ❤️

Apply low-pass filter...

= much easier job for the ML algo
Leveraging signal processing

On-device intelligence is not new

Neural networks are inefficient, if you can preprocess? Do so!

Significantly reduce input features, leading to smaller networks.

Cleans up input
ML Sensor pipeline is often combination
ML Sensor pipeline is often combination

Much more interesting
Wide range of parameters

Window length, window step, downsample?
Wide range of parameters

+ endless configuration options
Constrained targets - what’s worth it?
Introducing the EON Tuner!

Finding the most optimal architecture for your model (17 model variants evaluated / 50 variants total)

- cortex-m7-216mhz
- 1000 ms
- RAM: 128kB • ROM: 1024kB

Status:
- Pending
- Running
- Completed
- Failed
EON Tuner

Find best model for sensor data over mix of input blocks, DSP blocks and ML blocks

Specify device constraints

Extensible with your own DSP and ML blocks

Biggest win: "we found DSP configuration that works so well, we no longer need ML"
Still an engineering tool!
Eta: soon!

www.edgeimpulse.com
Automated TinyML

Zero-code SaaS solution

Create tiny models, ready for embedding, in just a few clicks!

Compare the benchmarks of our compact models to those of TensorFlow and other leading neural network frameworks.

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Optimized models for embedded
Optimized low-level NN libraries
(i.e. CMSIS-NN)
RTOS such as Mbed OS
Arm Cortex-M CPUs and microNPUs
Connect to high-level frameworks
Supported by end-to-end tooling
Connect to Runtime

Profiling and debugging tooling such as Arm Keil MDK

Application

Runtime (e.g. TensorFlow Lite Micro)

AI Ecosystem Partners

Stay Connected

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Resources: developer.arm.com/solutions/machine-learning-on-arm
TinyML for all developers

Data acquisition and enrichment:
- Acquire valuable training data securely
- Enrich data and train ML algorithms

Edge Device:
- Real sensors in real time
- Open source SDK

Embedded and edge compute deployment options:
- Test impulse with real-time device data flows

www.edgeimpulse.com
Advancing AI research to make efficient AI ubiquitous

Power efficiency
Model design, compression, quantization, algorithms, efficient hardware, software tool

Personalization
Continuous learning, contextual, always-on, privacy-preserved, distributed learning

Efficient learning
Robust learning through minimal data, unsupervised learning, on-device learning

Perception
Object detection, speech recognition, contextual fusion

Reasoning
Scene understanding, language understanding, behavior prediction

Action
Reinforcement learning for decision making

A platform to scale AI across the industry

Qualcomm AI Research is an initiative of Qualcomm Technologies, Inc.
Syntiant Corp. is moving artificial intelligence and machine learning from the cloud to edge devices. Syntiant’s chip solutions merge deep learning with semiconductor design to produce ultra-low-power, high performance, deep neural network processors. These network processors enable always-on applications in battery-powered devices, such as smartphones, smart speakers, earbuds, hearing aids, and laptops. Syntiant's Neural Decision Processors™ offer wake word, command word, and event detection in a chip for always-on voice and sensor applications.

Founded in 2017 and headquartered in Irvine, California, the company is backed by Amazon, Applied Materials, Atlantic Bridge Capital, Bosch, Intel Capital, Microsoft, Motorola, and others. Syntiant was recently named a CES® 2021 Best of Innovation Awards Honoree, shipped over 10M units worldwide, and unveiled the NDP120 part of the NDP10x family of inference engines for low-power applications.

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- Optimize the hardware, including sensor selection and placement

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Adaptive AI for the Intelligent Edge

LatentAI.com
Build Smart IoT Sensor Devices From Data

SensiML pioneered TinyML software tools that auto generate AI code for the intelligent edge.

- End-to-end AI workflow
- Multi-user auto-labeling of time-series data
- Code transparency and customization at each step in the pipeline

We enable the creation of production-grade smart sensor devices.

sensiml.com
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