Using ML at the Edge to Improve Data Gathering

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Who am I?

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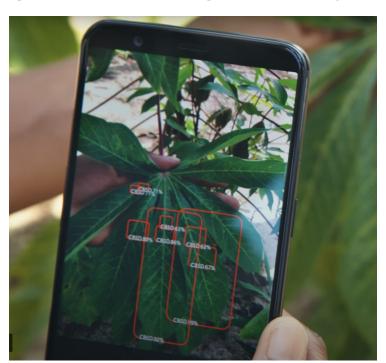Technical Lead of the TensorFlow Lite Micro open source machine learning project

Why am I here?

When you think about machine learning, you probably think about data centers:

Why am I here?

My work is about bringing machine learning into the physical world:

What does this have to do with climate science?

Our technology is way better at gathering data through sensors than sending it to the cloud.

Almost all sensor data is wasted. You can power a microphone or camera for a year on a pair of AA batteries. Even low-power radio transmission (cell, LoRA, BLE, or Wifi) will drain those in a day or less.

If you process the raw data locally with machine learning, you can turn it into actionable information that can be sent in much smaller packets at intervals.

Estimating air quality through camera images
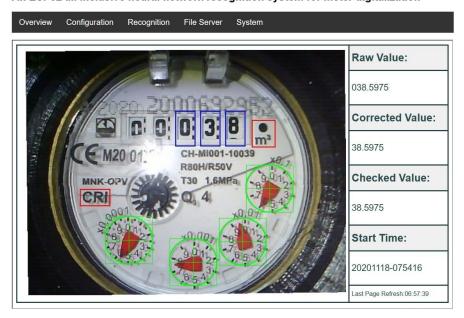
Protecting rainforests by detecting chainsaws

You don't need a phone

TensorFlow Lite Micro runs on tiny cheap devices like the Raspberry Pi Pico for $4

With battery power or energy harvesting through solar, these devices can be deployed in large numbers in almost any environment.

Existing infrastructure can become smart

https://github.com/jomjol/AI-on-the-edge-device

How can you use it?

I don't know your domains, what the problems you're facing are. Imagine you had an unlimited number of volunteers willing to stand all day and night anywhere on the planet, texting you what they see and hear. Ground-level satellite data is another way to think about it.

I'm hoping you'll be inspired by some of these examples, and pick up the open source tools and tutorials that are available, and apply them to issues that need solutions.

There's a free course in collaboration with Harvard at https://www.edx.org/professional-certificate/harvardx-tiny-machine-learning

Questions?

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