

Workshop on Widening Access to TinyML Network by Establishing Best Practices in Education



3 - 7 July 2023
An ICTP Meeting
Trieste, Italy

Further information:
<http://indico.ictp.it/event/10185/>
smr3851@ictp.it

Launching TinyML edX and Long Term Support



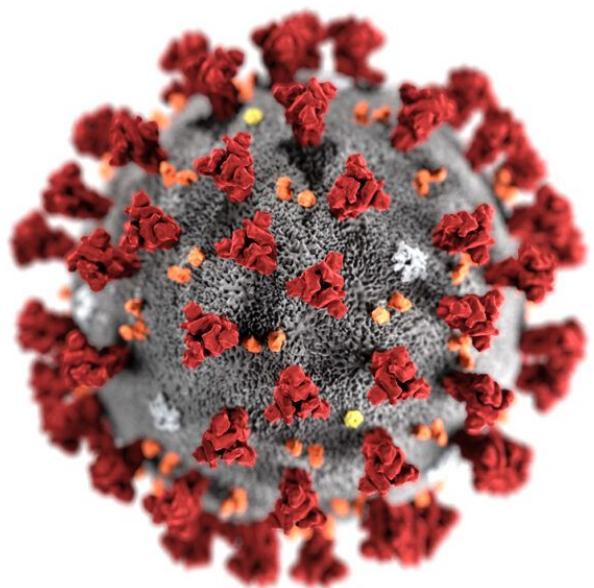
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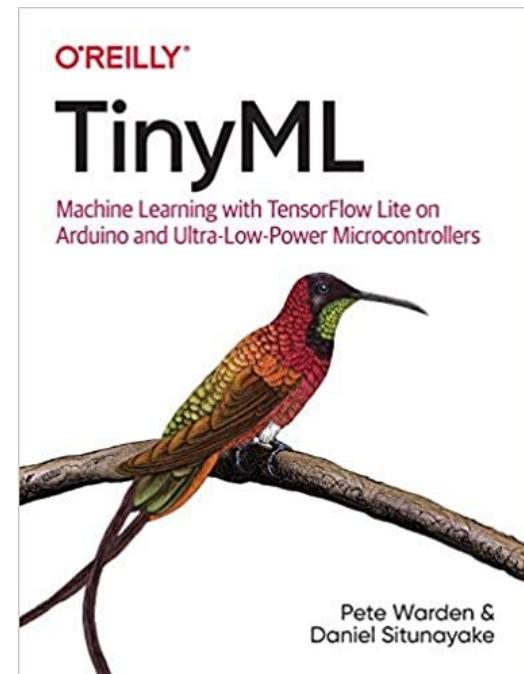
1. Why TinyML on edX?
2. The Development Process and Lessons Learned
3. Long Term Support Successes and Challenges

Why TinyML on edX?

Setting the Context



Late
Spring
2020



Setting the Context



Let's Teach a Course on TinyML

The screenshot shows a dark-themed website for a machine learning course. At the top, there is a navigation bar with links for Home, Lectures, Final Projects, Assignments, HarvardX, and FAQ. A magnifying glass icon indicates a search function. Below the navigation bar, the course title "CS249r: Tiny Machine Learning" is prominently displayed in large white letters. Underneath the title, a subtitle reads "Applied Machine Learning for Embedded IoT Devices". On the left side of the main content area, there is a small image of the man from the previous photo, wearing a red and black plaid scarf and sitting at a desk with a laptop.

TinyML

Home Lectures Final Projects Assignments HarvardX FAQ

CS249r: Tiny Machine Learning

Applied Machine Learning for Embedded IoT Devices

Setting the Context

Can we broaden access to our course?



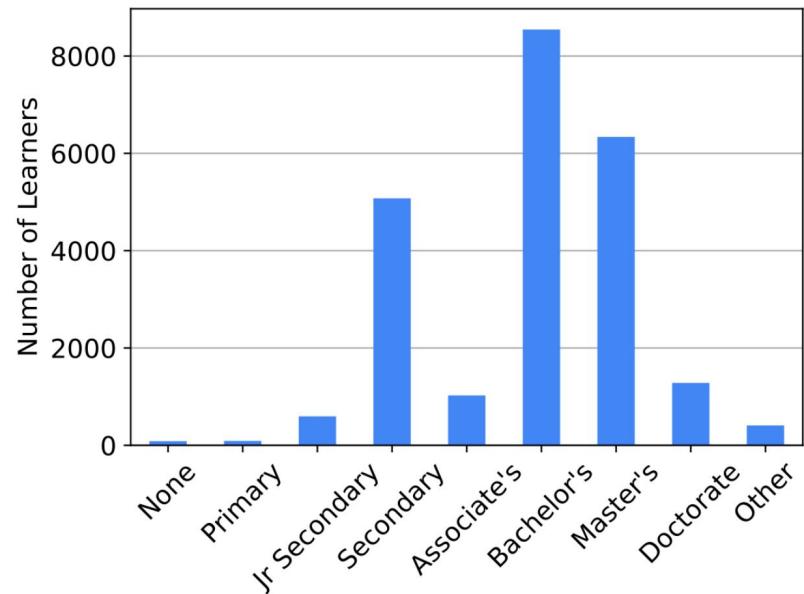
Why not work
with us?



The Development Process and Lessons Learned

Why is an edX Course Different?

1. Students are both **More and Less** Experienced
2. Increased Challenge of **“Chunking”** to Preserve Learner Attention
3. **Inability to Directly Support** all Learners Especially with IT



The Development Process

1

Course
Design

Domain Expert
Interviews

Module Topic
Outlines

Pedagogical
Overlay and
“Chunking”

2

Content
Development

Distributed
Development

Content
Smoothing

Formatting and
Slide Development

3

Production

Copyright
Analysis

Video Recordings

Content Uploads

Creative Team
Post-Processing

Final
Reviews

Key Lessons Learned

Simplify the Barriers to Entry to Attract Students (Colab + Low-Cost Kit)

Real-World Hands-On Applications Retain Learners

Large Teams of Diverse Experts are Needed for Fast Timelines (Content + Formatting + Platform)

Industry Collaborations are Vital (Google, ARM, Arduino)

Process Matters – Collocation Does Not

Less is More

Hardware is Hard

Long Term Support Successes and Challenges

Long Term Support Successes and Challenges

1. Videos Can't be Changed (Easily)
2. Future Proofing by Design
3. Prepare for Surprises
4. Plan for Who Does the Support

- Videos as Background and **Fundamentals**.
- Code and Hands-On pegged to **Specific Versions** of OSS but prepare for the version to **No Longer Work!**
- 2 Year Support can be You – 5+ years needs a **Transition Plan!**

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ICTP arm ML

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