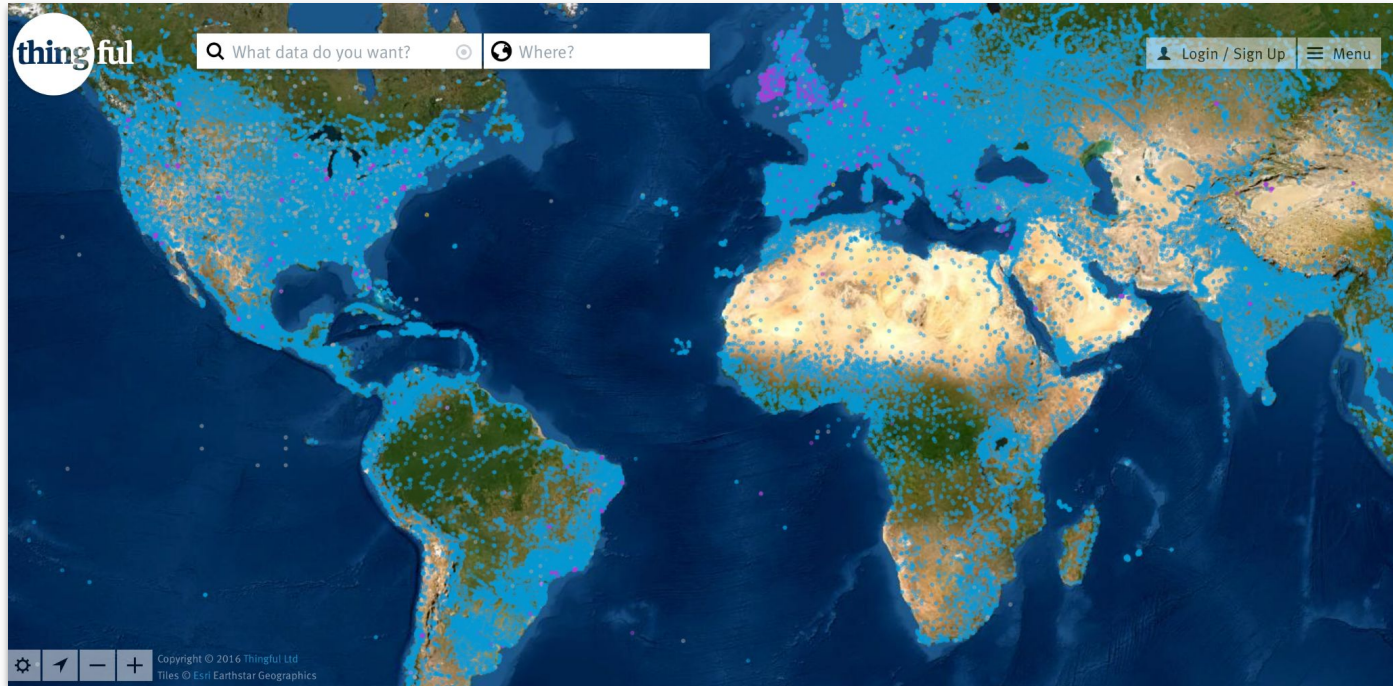


Academic Network: Next Step

Marco Zennaro and Brian Plancher



Data divide



Data divide

Antarctic seals recruited to measure effects of climate change

Deep-diving animals collected data that could be used to sharpen projections of rising seas.

Alex Fox



RELATED ARTICLES

Rescued radar maps reveal past

Antarctica's sleeping ice wake soon

Antarctic coast meltdown ice-sheet collapse

SUBJECTS

Applied physics Climate

IoT and SDGs



IoT and SDGs

➤ SDG 2: ZERO HUNGER:

An estimated 821 million people were undernourished in 2017. Annual cereal production will need to rise to about 3 billion tonnes and annual meat production will need to rise by over 200 million tonnes to reach 470 million tonnes to feed 9.1 billion people by 2050.

➤ SDG 3: GOOD HEALTH AND WELL-BEING:

3 billion people worldwide lack access to basic sanitation. Noncommunicable diseases alone will cost low- and middle-income countries more than \$7 trillion in the next 15 years.

IoT and ICT4D

The case for Technology in developing regions, E.Brewer et al., IEEE Pervasive Computing, 2005

The paper claims that there are four technological requirements for an ICT4D project to be successful:

Autonomous Connectivity

Low-cost equipment

Power resilience

Appropriate User Interface

IoT and ICT4D - TinyML

The case for Technology in developing regions, E.Brewer et al., IEEE Pervasive Computing, 2005

The paper claims that there are four technological requirements for an ICT4D project to be successful:

- ✓ **Autonomous Connectivity**
- ✓ **Low-cost equipment**
- ✓ **Power resilience**
- ✓ **Appropriate User Interface**

Why a TinyML Academic Network?

We aim to ultimately develop a **community of researchers and practitioners** focused on both improving **access to TinyML education** and **enabling innovative solutions** for the unique challenges faced by Developing Countries.

- Joint **workshops and seminars** on TinyML with lab sessions hosted by and for network members
- An **online forum** to consolidate the TinyML community of researchers, educators, and practitioners
- **Open exchange** of student projects, lesson plans, real-world deployments and outreach materials

Working Group - tinymledu.org



**Vijay
Janapa Reddi**



**Brian
Plancher**



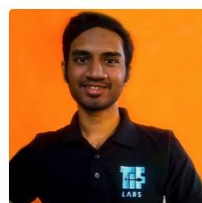
**Marco
Zennaro**



**Marcelo
Rovai**



**Hal
Speed**



**Daniel
D'souza**



**Gregg
Barrett**



**Andres
Monsalvo**

**And many others!
And maybe you?**



**Jesús
Alfonso
López Sotelo**

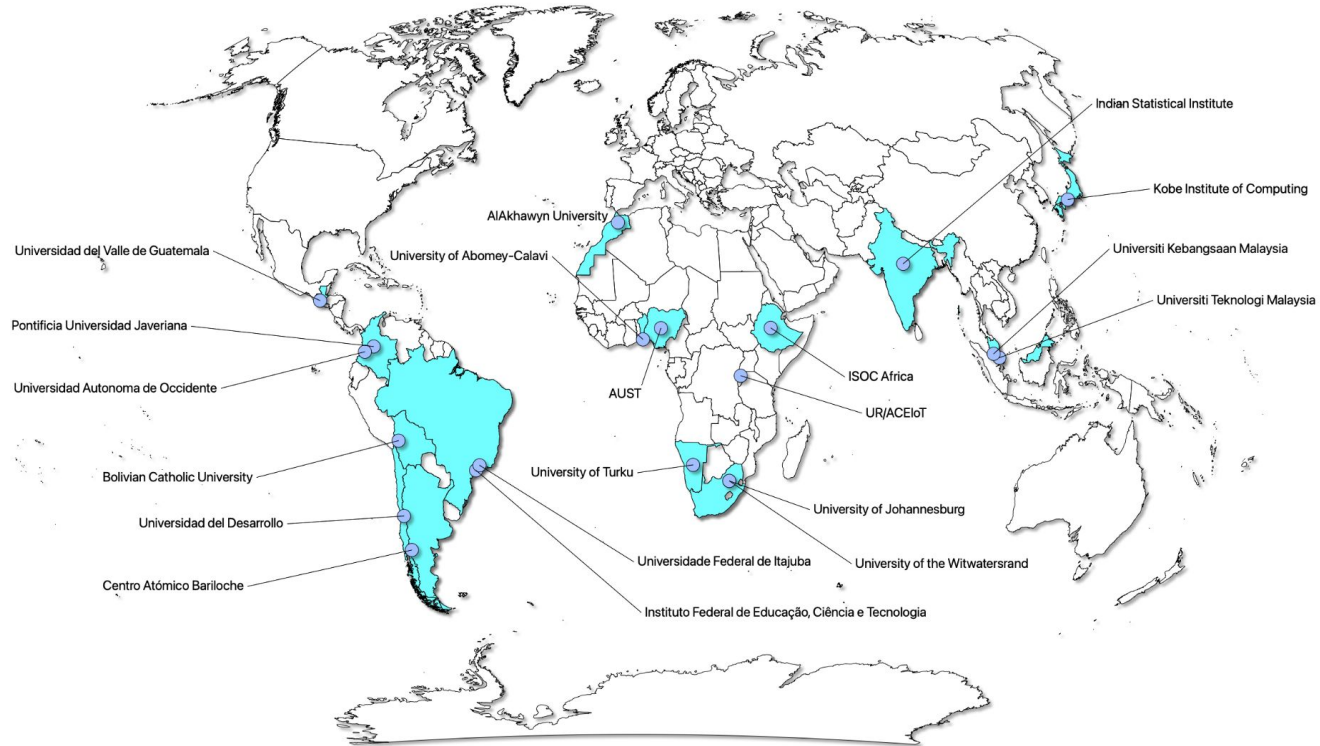


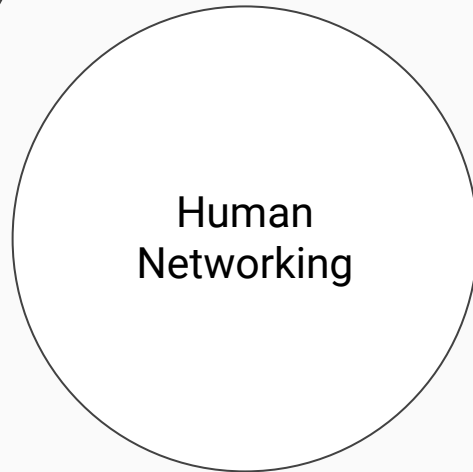
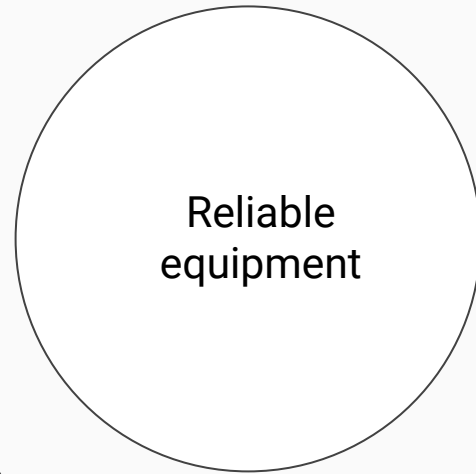
**Mohd
Ridzuan Bin
Ahmad**



**Jose Alberto
Ferreira Filho**

TinyML academic network





Good
Best
training
material



Overview Reports & Analytics Projects Packages

MARCELO ROVAI, MD

Hi there, I'm Marcelo Rovai

"I am always doing what I cannot do yet, in order to learn how to do it"

Vincent Van Dugh

Languages and Tools:

C++ PYTHON

SQL MATLAB / PARIAS / MATLAB / STATA / TRANSPLATE

SCIKIT-LEARN / SPSS / C-ORCA

Marcelo Rovai
Micro

Follow

Professor, Engineer, MBA, Master's in

SciTinyML: Scientific Use of Machine Learning on Low-Power Devices

18 - 22 October 2021
An ICTP Virtual Meeting
Trieste, Italy

SciTinyML enables machine learning technologies to perform on-device analytics of sensor data of extremely low power. This allows for new scientific applications to be developed of an extremely low cost and on a large scale.

In recent years, hardware advancements have made it possible for microcontrollers to perform calculations much faster. Improved hardware has made easier for developers to build programs on these devices. Perhaps the most important trend for scientists has been the rise of Tiny Machine Learning or TinyML.

Between hardware advancements and the TinyML community's recent innovations in machine learning, it is now possible to run intelligence on embedded power systems and machine learning communities, which traditionally have operated independently.

Topics:

- ML general concepts
- Scientific Applications of ML
- Introduction to TinyML
- Examples of TinyML applications

How to apply: **Registration:**

Deadline: **8 October 2021**

ICTP INTERNATIONAL CENTRE FOR THEORETICAL PHYSICS

<https://tinymledu.org/teach>

Course Name	Date of Course	Target Audience	Language of Instruction	Language of Materials	Course Website	Materials Link
edX tinyML Specialization	Launched 2020-2021	Everyone	English	English	<u>link</u>	<u>link</u>
Harvard CS249r	Sept-Dec 2020	Graduate Students	English	English	<u>link</u>	<u>link</u>
UNIFEI IESTI01-T01	Jan-July 2021	Undergraduate Students	Portuguese	English	<u>link</u>	<u>link</u>
UNIFEI IESTI01-T02	Aug-Dec 2021	Undergraduate Students	Portuguese	English	<u>link</u>	<u>link</u>
CRESTLEX 3.0	June 2021	Middle and High School Students and Teachers	English	English	<u>link</u>	<u>link</u>

Have **questions** about how to adapt the materials?

Suggestions for how to make them easier to use?

Reach out on Discord!



Reliable
equipment

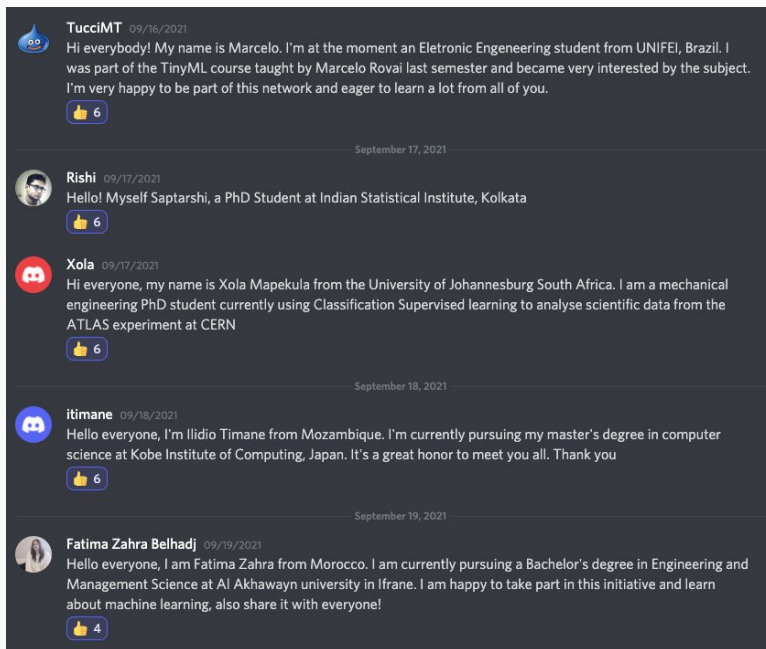
Devices should be
available from Arduino
by the end of the year!

We are **#1** on the list!

Human
Networking



+300 members!

A screenshot of a Discord chat thread on a dark background. It shows four messages from different users, each with a profile picture, name, timestamp, text content, and a thumbs-up icon with a number of reactions.

TucciMT 09/16/2021
Hi everybody! My name is Marcelo. I'm at the moment an Eletronic Engineering student from UNIFEI, Brazil. I was part of the TinyML course taught by Marcelo Rovai last semester and became very interested by the subject. I'm very happy to be part of this network and eager to learn a lot from all of you.
6

September 17, 2021

Rishi 09/17/2021
Hello! Myself Saptarshi, a PhD Student at Indian Statistical Institute, Kolkata
6

Xola 09/17/2021
Hi everyone, my name is Xola Mapekula from the University of Johannesburg South Africa. I am a mechanical engineering PhD student currently using Classification Supervised learning to analyse scientific data from the ATLAS experiment at CERN
6

September 18, 2021

itimane 09/18/2021
Hello everyone, I'm Ildio Timane from Mozambique. I'm currently pursuing my master's degree in computer science at Kobe Institute of Computing, Japan. It's a great honor to meet you all. Thank you
6

September 19, 2021

Fatima Zahra Belhadj 09/19/2021
Hello everyone, I am Fatima Zahra from Morocco. I am currently pursuing a Bachelor's degree in Engineering and Management Science at Al Akhawayn university in Ifrane. I am happy to take part in this initiative and learn about machine learning, also share it with everyone!
4

Roadmap

Network
Creation

July 21

ICTP Workshop

Oct 21

Devices Setup

Dec 21
Jan 22

TinyML Labs

Jan 22

Regional
Workshops

Mar 22

Way forward

Call for next 20
members

Dec 21

Competitions?

ITU AI4Good?

Students
Exchange?

Student
projects?

Advanced
Workshops?

F2F
Workshops?

Where to learn more about TinyML

edX

Search online courses

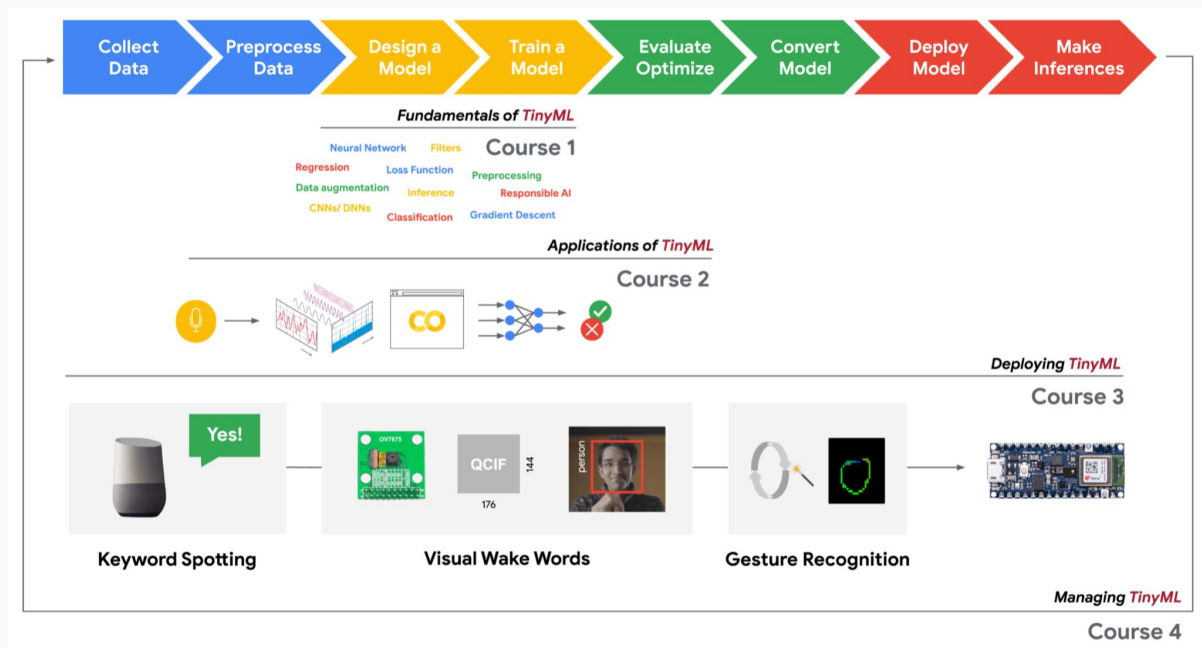
Catalog > Data Science Courses > HarvardX's Tiny Machine Learning (TinyML)

The Future of ML is Tiny and Bright

HARVARD UNIVERSITY

Professional Certificate in
Tiny Machine Learning (TinyML)

I'm interested



Where to learn more about TinyML



Computer Vision with Embedded Machine Learning

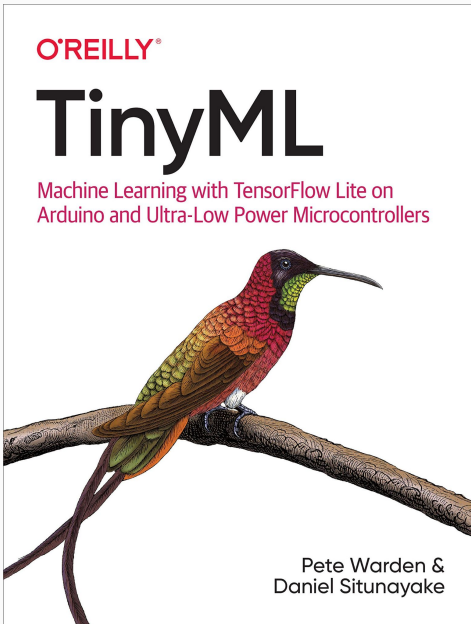
This course, offered by a partnership among Edge Impulse, OpenMV, Seeed Studio, and the TinyML Foundation, will give you an understanding of how deep learning with neural networks can be used to classify images and detect objects in images and videos.

[Take the Course on Coursera](#)

Introduction to Embedded Machine Learning

This course will give you a broad overview of how machine learning works, how to train neural networks, and how to deploy those networks to microcontrollers using the Edge Impulse Platform.

[Take the Course on Coursera](#)



The image is a screenshot of a Coursera profile page for Laurence Moroney. At the top, there's a search bar and navigation links for 'Explore', 'For Enterprise', 'For Students', 'Log In', and 'Join for Free'. The profile section includes a circular profile picture of Laurence Moroney, his name, title 'Instructor', and the course 'DeepLearning.AI'. Below this is a 'Bio' section with a paragraph of text. Underneath is a 'Courses' section with a grid of course cards. Each card has a title, a description, and a 'Take the Course on Coursera' button. The courses listed are: 'Introduction to TensorFlow for Artificial Intelligence, Machine Learning, and Deep Learning', 'Convolutional Neural Networks in TensorFlow', 'Custom Models, Layers, and Loss Functions with TensorFlow', 'Advanced Computer Vision with TensorFlow', 'Sequences, Time Series and Prediction', and 'Device-based Models with TensorFlow Lite'.

Post Course Survey

<https://bit.ly/SciTinyML-PostSurvey>

Thanks!



Harvard John A. Paulson
School of Engineering
and Applied Sciences



Google



EDGE
IMPULSE

HarvardX



TensorFlow Lite