

# TinyML Seminar #3

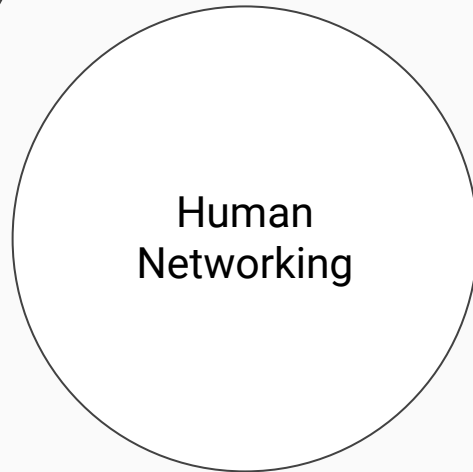
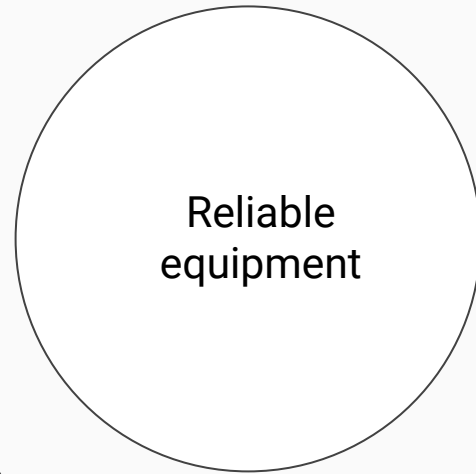
Marco Zennaro,  
mzennaro@ictp.it

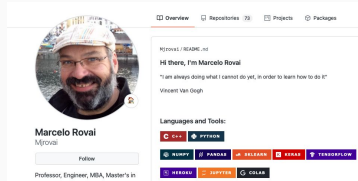
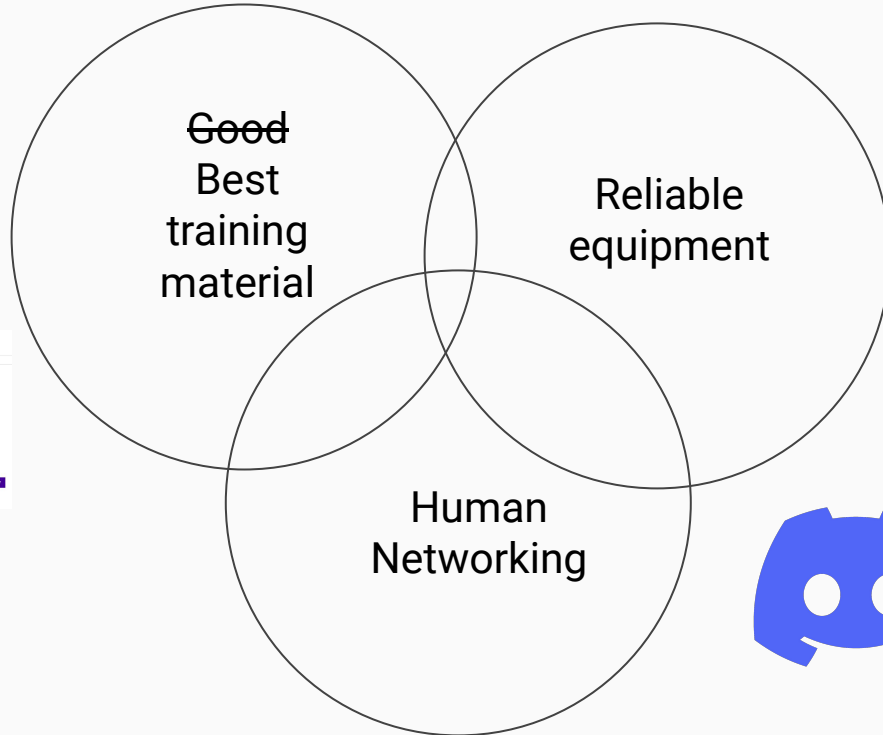


# Why a TinyML Academic Network?

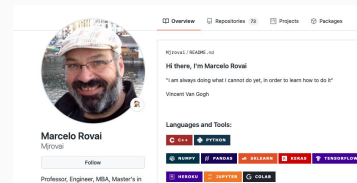
We aim to ultimately develop a **community of researchers and practitioners** focused on both improving **access to TinyML education** and **enabling innovative solutions** for the unique challenges faced by Developing Countries.

- 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





Good  
Best  
training  
material



- *September 17*: Academic Network Introduction and Why the Future of ML is Tiny and Bright with [Prof. Vijay Janapa Reddi](#) of Harvard University. [Vijay's slides](#). [Full Seminar Video](#).
- *October 1*: Software Tools for TinyML with [Prof. Marcelo Rovai](#) of Universidade Federal de Itajubá. [Marcelo's Slides](#). [Full Seminar Video](#). [Chat Log](#).

## <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	<a href="#">link</a>	<a href="#">link</a>
Harvard CS249r	Sept-Dec 2020	Graduate Students	English	English	<a href="#">link</a>	<a href="#">link</a>
UNIFEI IESTI01-T01	Jan-July 2021	Undergraduate Students	Portuguese	English	<a href="#">link</a>	<a href="#">link</a>
UNIFEI IESTI01-T02	Aug-Dec 2021	Undergraduate Students	Portuguese	English	<a href="#">link</a>	<a href="#">link</a>
CRESTLEX 3.0	June 2021	Middle and High School Students and Teachers	English	English	<a href="#">link</a>	<a href="#">link</a>

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Day	Date	Morning Session 9am–11am MT	Afternoon Session 12pm–2pm MT
1	Tuesday, 6/22	<a href="#">The Future of Artificial Intelligence</a>	<a href="#">Experimenting with AI</a>
2	Wednesday, 6/23	<a href="#">How Machine Learning Works</a>	<a href="#">Exploring Machine Learning with Edge Impulse</a>
3	Thursday, 6/24	<a href="#">How can I use ML in my Community?</a>	<a href="#">Build it! Creating your own application with Edge Impulse</a>
4	Friday, 6/25	<a href="#">Responsible AI</a>	<a href="#">What's Next?</a>

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

**Suggestions** for how to make them easier to use?

**Reach out on Discord!**





Reliable  
equipment

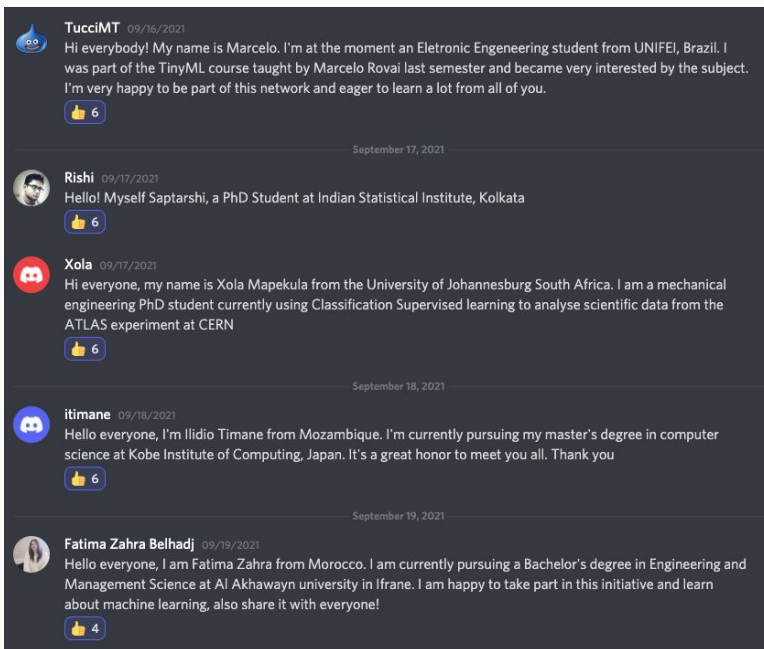
Devices should be  
available from Arduino  
by the end of the year!

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

Human  
Networking



## 160 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 count.

**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

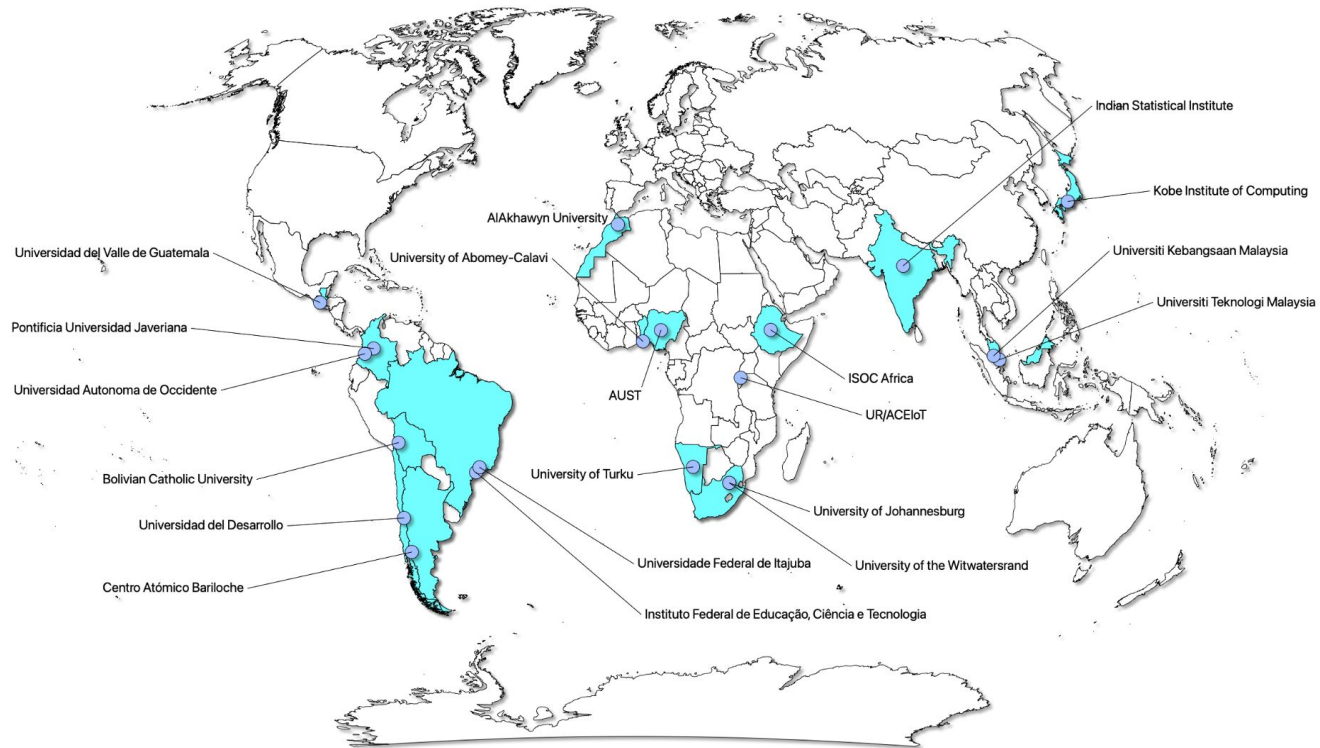
September 18, 2021

**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

# TinyML academic network



## Americas:

### Colombia

- 1- Pontificia Universidad Javeriana - Bogotá, Colombia
- 2- Universidad Autónoma de Occidente - Cali, Colombia

### Argentina

- 3- Centro Atómico Bariloche /Instituto Balseiro

### Brazil

- 4- UNIFEI - Universidade Federal de Itajubá
- 5- IFSP - Instituto Federal de São Paulo

### Chile

- 6- UDD - Universidad del Desarrollo

### Guatemala

- 7- Universidad del Valle de Guatemala

### Bolivia

- 8- Universidad Católica Boliviana "San Pablo" Regional La Paz

## Africa:

### Ethiopia

9- Internet Society

### Benin

10- University of Abomey-Calavi

### Rwanda

11- University of Rwanda

### Namibia

12- University of Turku in Namibia

### Nigeria

13- African University of Science and Technology

### Morocco

14- Al Akhawayn University in Ifrane

### South Africa

15- University of Johannesburg

16- University of Witwatersrand

Asia:

Malaysia

17- Universiti Kebangsaan Malaysia

18- Universiti Teknologi Malaysia

India

19- Indian Statistical Institute

Japan

20- Kobe Institute of Computing

# Roadmap

Network  
Creation

July 21

Seminar #1  
Intro to TinyML

Sept 21

Seminar #2  
Tools Setup

Oct 21

Seminar #3  
Networking

Oct 21

ICTP Workshop

Oct 21

Devices Setup

Dec 21  
Jan 22

TinyML Labs

Jan 22

Regional  
Workshops

Mar 22


# Case Studies

## AFIB\* and SR\*\* detection using ML in embedded systems

Professors: José Alberto, Marcelo Rovai  
Scrum Master: Rodrigo Moreni  
Students: Guilherme Silva, Mateus Lima



\* AFIB (Atrial Fibrillation)



AFRICAN CENTER OF EXCELLENCE  
IN  
INTERNET OF THINGS

ACEIT  
UNIVERSITY OF  
RWANDA  
THE WORLD BANK

### Offline Prediction of Cholera in Rural Communal Tap Waters Using Edge AI inference


Marvin Muyonga Ogore  
Dr. NSENGA Jimmy  
Dr. NKURIKIYEYEU Kizito

The slide features a video call inset of a man in a white shirt and headset. The background is white with blue and green diagonal stripes. Logos for ACEIT, University of Rwanda, and The World Bank are visible. The main title is in a blue box.




# Case Studies

**Coffee disease classification with ML**  
João Vitor Yukio Bordin Yamashita  
joao.yamashita@unifei.edu.br



**COVID-19: Detection by Cough**



TINYML 4D - ACADEMIC NETWORK

# Breakout Rooms

**Get to know each other!**

**Find common interests!**

(teaching TinyML, applications, research, etc)

**Create new channels in Discord!**

(language, geography, interest, etc)!

**Choose your own adventure!**

# Working Group



**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**

# Thanks!



Harvard John A. Paulson  
School of Engineering  
and Applied Sciences



Google



EDGE  
IMPULSE

HarvardX



TensorFlow Lite

Tell me and I forget,  
teach me and I may  
remember, involve me  
and I learn.

-- Benjamin Franklin