

Welcome!

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TinyML4D Academic Network Co-Chair



TINYML4D

About me

Marco Zennaro, PhD

Researcher at the International Centre for Theoretical Physics

Coordinator of the Science, Technology and Innovation Unit

Focal Point for the ITU Centre of Excellence in IoT, Big Data and Statistics

Sensemaking Senior Research Fellow of the MIT International Development Initiative

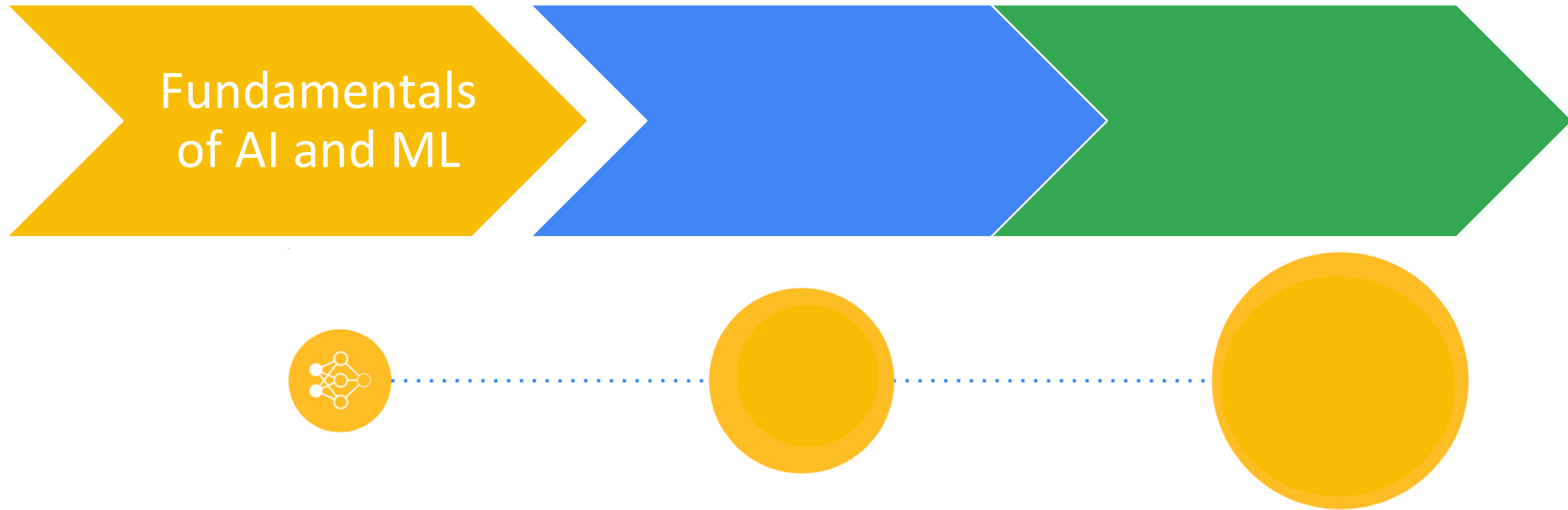
Visiting Professor at Kobe Institute of Computing (KIC) in Kobe, Japan

TinyML4D Academic Network Co-Chair

IEEE Senior Member and an ACM Senior Member

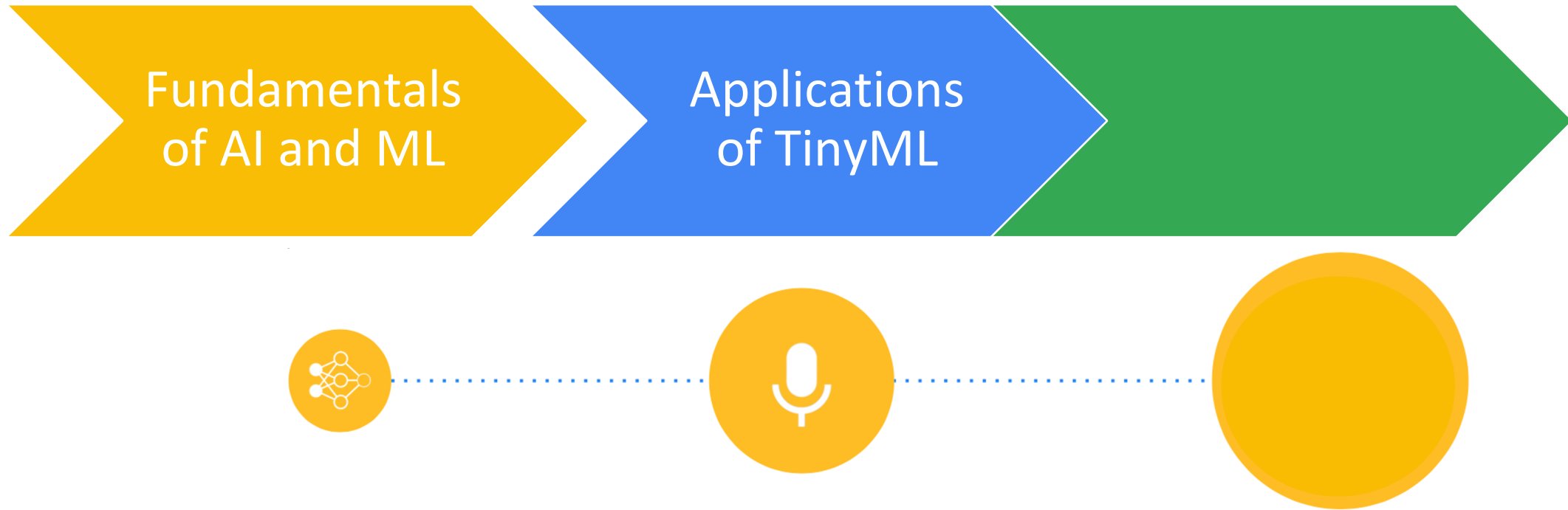
What will we learn?

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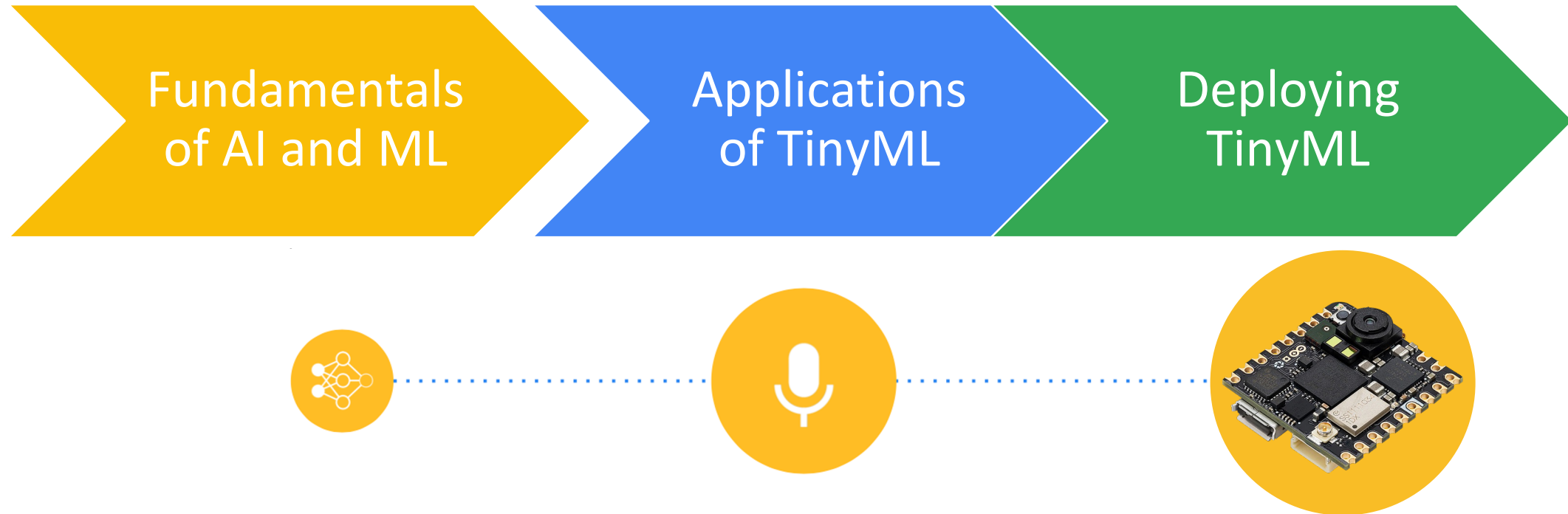
We will be talking about what is the language of **Artificial Intelligence (AI)** and **Machine Learning (ML)**

What will we learn?



We will get a sneak peek into the variety of different **TinyML (Embedded Machine Learning)** applications, as keyword spotting (“Alexa”), image recognition and so forth.

What will we learn?



We will **also** learn how to deploy models on real devices such **as smartphones and microcontrollers**. Along the way, we will explore the challenges unique to and amplified by TinyML (e.g., preprocessing, post-processing, and dealing with resource constraints).

How are we going to get there?

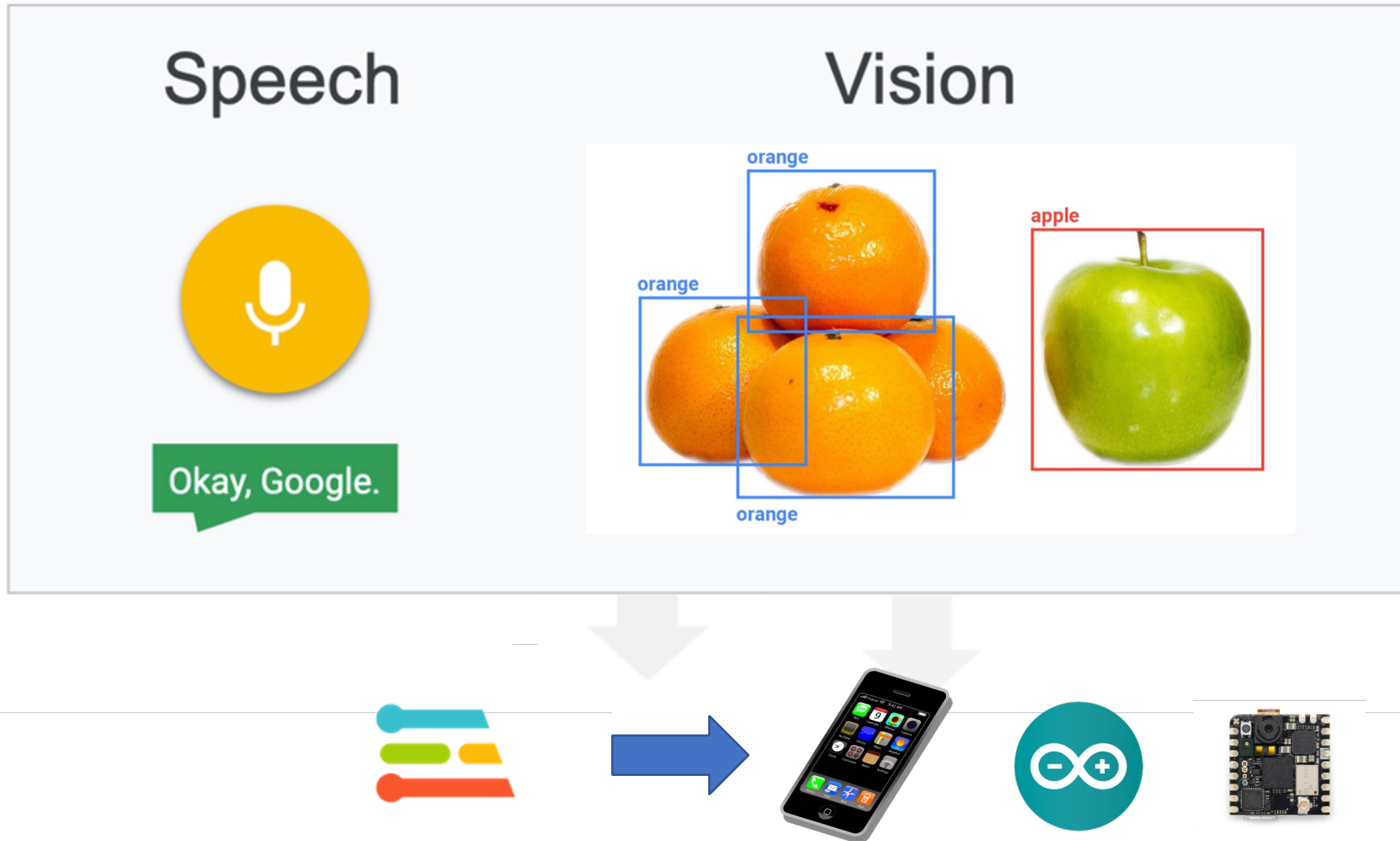
Edge Device



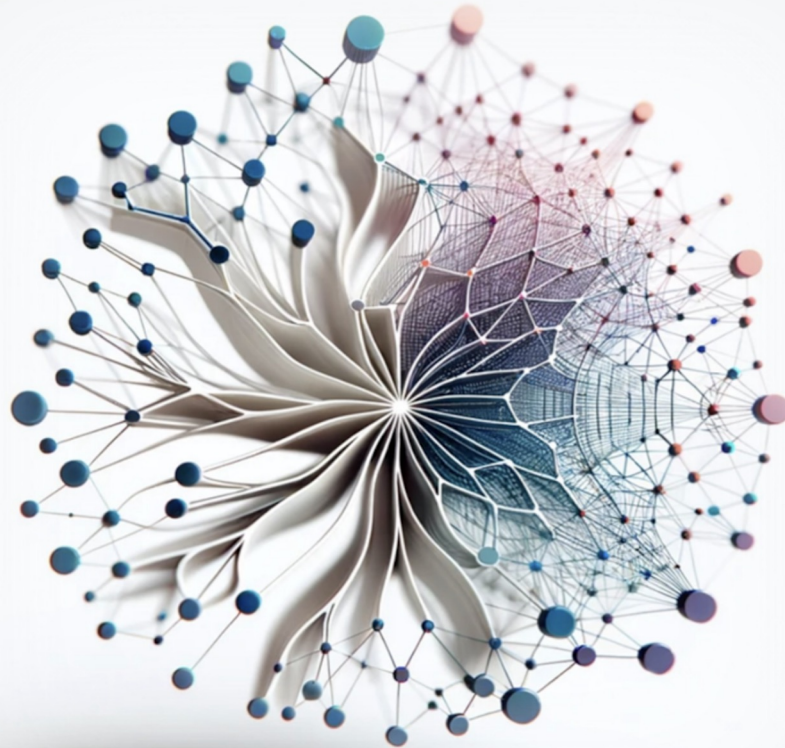
& Sensors



Hands-on Activities



Machine Learning Systems with TinyML



Edited by Prof. Vijay Janapa Reddi
Harvard University



https://github.com/harvard-edge/cs249r_book



https://mjrovai.github.io/XIAO_Big_Power_Small_Board-ebook/

Agenda

- Day 1
 - Keynote: TinyML for Good
 - Introduction to TinyML
 - Presentation of TinyML projects
 - Lab: Introduction to Teachable Machine
- Day 2
 - Intro to ML + Convolutions
 - Group Picture
 - IoT for SDGs
 - Intro to Arduino
 - Lab: Hands-On Computer Vision

Tentative Agenda

- Day 3
 - Preprocessing for Audio and Keyword Spotting
 - Ethics of AI
 - Lab: Hands-On Keyword Spotting
- Day 4
 - AI for Good
 - Prompt Engineering
 - Empower every stage of TinyML application development
 - Group project

Tentative Agenda

- **Day 5**
 - Presentations of Group Projects / Case Studies from Participants
 - Group Discussion, TinyML Academic Network, Workshop closing and Certificates
- **Logistics**
 - You are free to take your coffee/tea/coke break and your lunch break outside UNU.
 - For ICTP-supported participants: your allowance is meant to support expenses for lunch/dinners/breaks.

Labs



Things will not work (we all have different operating systems, network setups, etc)

We will make things work together.

Please be nice to your colleagues and share your knowledge.

"What we have to learn to do, we learn by doing."

Aristotle

Thank you!

Serge Stinckwich, UNU
Louisa Lei, UNU
Sut Meng Ho, UNU
Ally Nyamawe, UNU
Jia An Liu, UNU



UNU
Macau

Adriana Pinto, ICTP
Serena Fanni, ICTP
Ingrid Perper, ICTP



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**International Centre
for Theoretical Physics**

About you

Please introduce yourself and let us know:

what is your interest in TinyML?

do you have a project/application in mind already?

have you worked with Arduino?