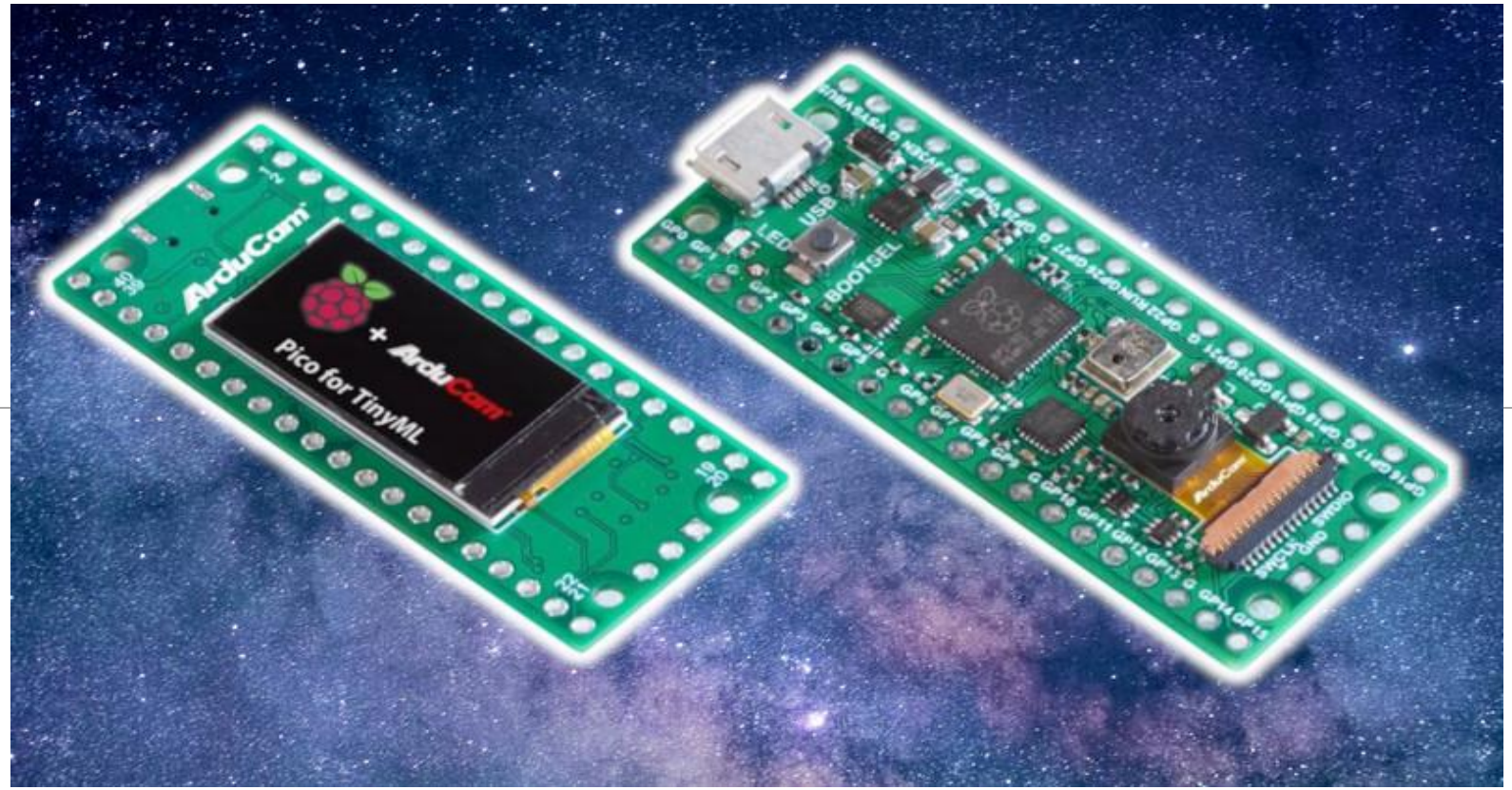
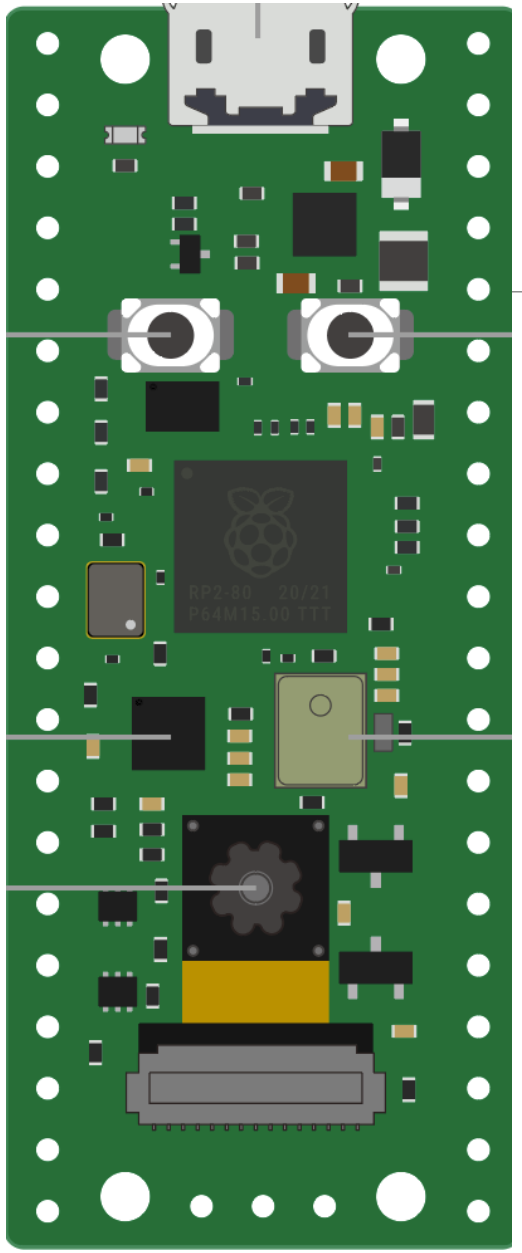
Learning TinyML

Pico4ml first impression

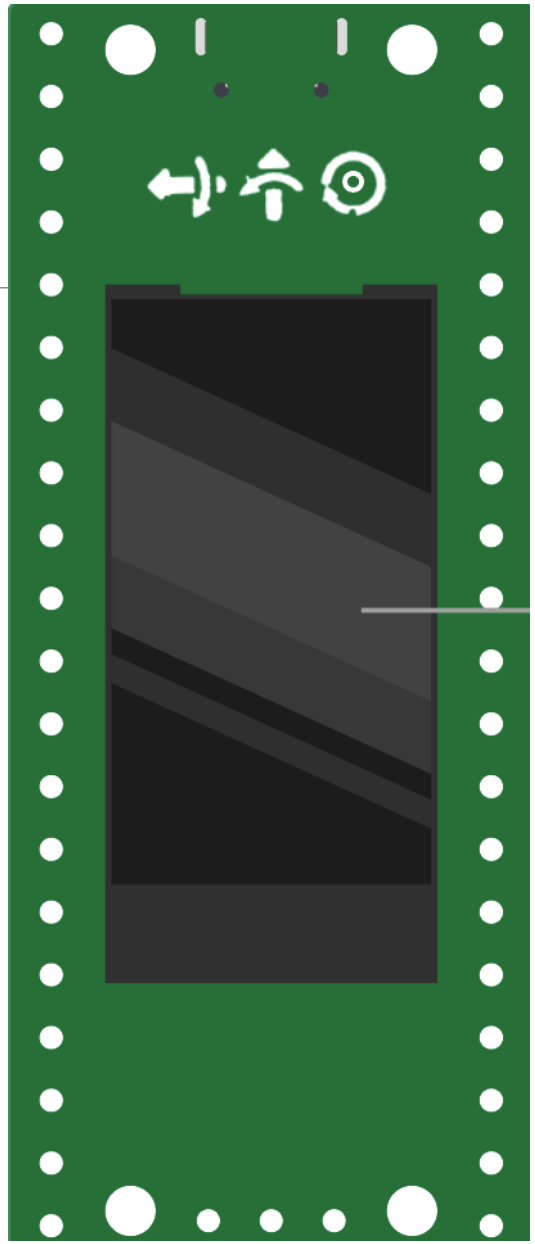


Yogesh M Iggalore



An RP2040 Based TinyML Dev Board

- Microcontroller: Raspberry Pi RP2040
- IMU: ICM-20948 (low power)
- Mono channel microphone w/ direct PCM output
- Buttons: Reset & Boot
- Camera Module: HiMax HM01B0, Up to QVGA (320 x 240)
- Screen: 0.96 inch LCD SPI Display (160 x 80, ST7735)
- Operating Voltage: 3.3V
- Current Draw (standby): 40mA
- Current Draw (running ML models): 60mA
- Input Voltage: VBUS: 5V +/- 10%. VSYS Max :5.5V
- Length: 51 mm
- Width: 21 mm



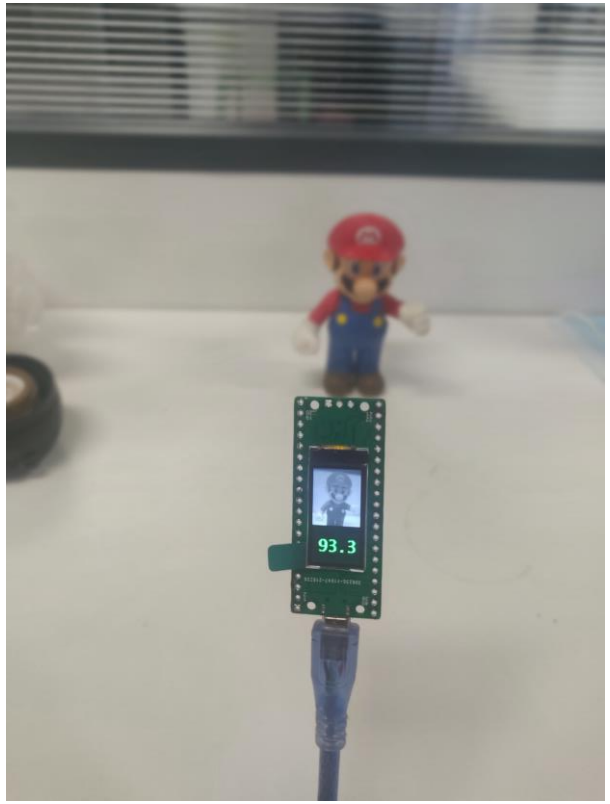
RP2040 Key features

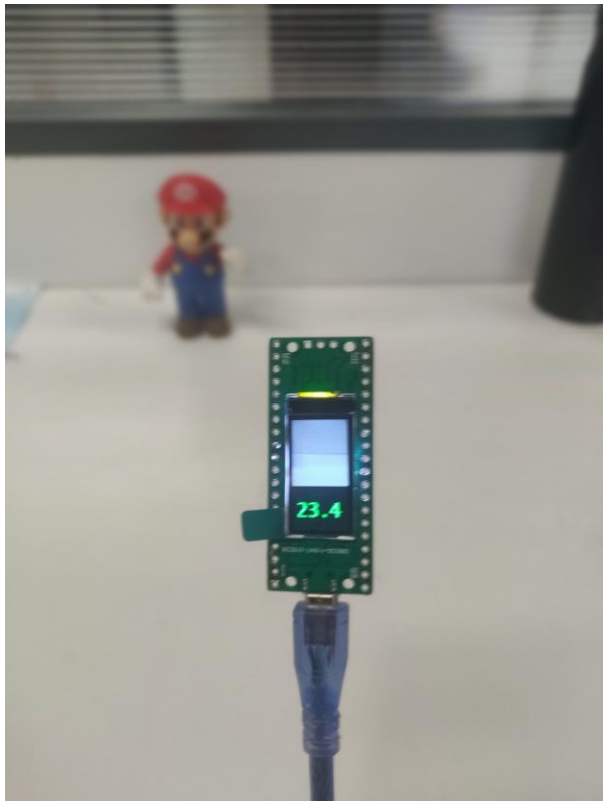
Dual ARM Cortex-M0+ @ 133MHz

- 264kB on-chip SRAM in six independent banks
- Support for up to 16MB of off-chip Flash memory via dedicated QSPI bus
- DMA controller
- On-chip programmable LDO to generate core voltage
- 2 on-chip PLLs to generate USB and core clocks
- 30 GPIO pins, 4 of which can be used as analogue inputs
- Peripherals
  - 2 UARTs
  - 2 SPI controllers
  - 2 I2C controllers
  - 16 PWM channels
  - USB 1.1 controller and PHY, with host and device support
  - 8 PIO state machines

Demo: Wake word detection

Demo: Person Detection





Demo: Magic Wand

print(”Thank You”)