



**CAÑIÑOS
LOUCOS**
.org

A large flock of birds is silhouetted against a bright sunset sky. The sun is low on the horizon, creating a warm orange and yellow glow. The birds are scattered across the upper two-thirds of the frame, appearing as a dense cloud of small dark shapes. In the foreground, the dark silhouettes of trees and buildings are visible against the horizon.

Our vision





Trillions of EDGE Computers



**CITI-USP has a
manufacturing line**



We had decided to design and
manufacture Edge Computers in Brazil

Agro 4.0

Smart Home

Cyber Physical Systems

Industry 4.0

IA

GDPR

Social IoT

Smart Cities

Smart Office

Big Data Analysis

Block Chain

**Jon
Maddog
Hall**



Jon Maddog Hall



Linus Torvalds

Open Software in 99,9% Consumer Electronics Industry



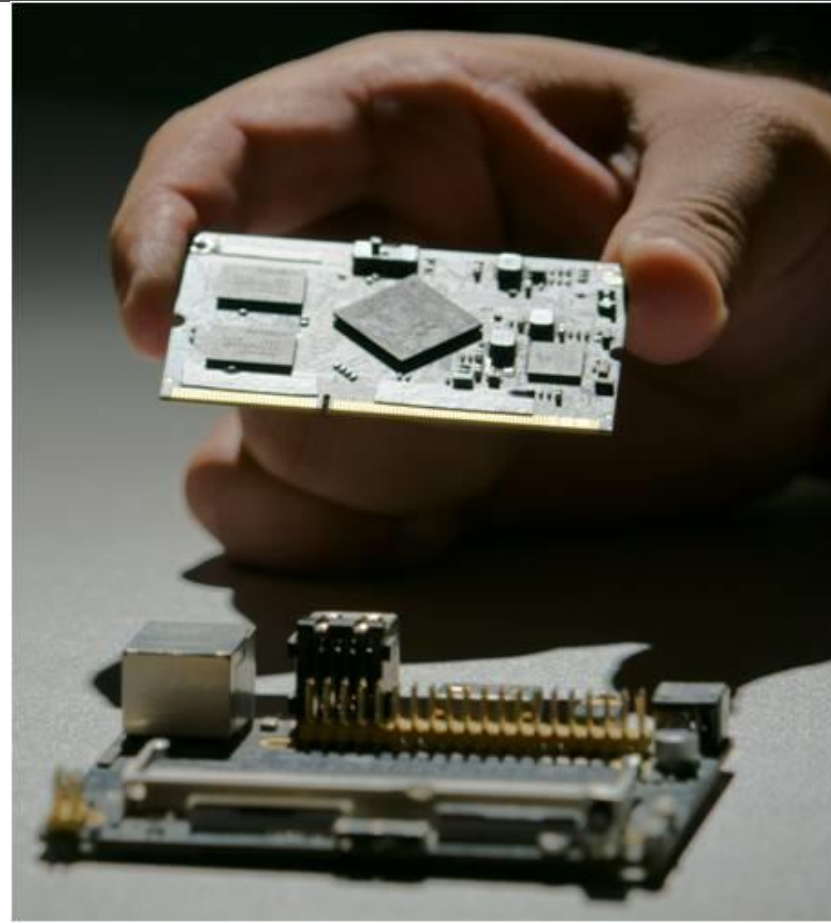
National Single Board Computer Program



Reference boards for Edge Computing

Modules to be embedded in IoT products

- **Gain of scale**
- Shorter *time-to-the-market*
- Lower non-recurring engineering costs
- IoT x Comercial Trade
- Contribute with national engineer competitiveness
- Local problem, global opportunity
- Longevity of solutions



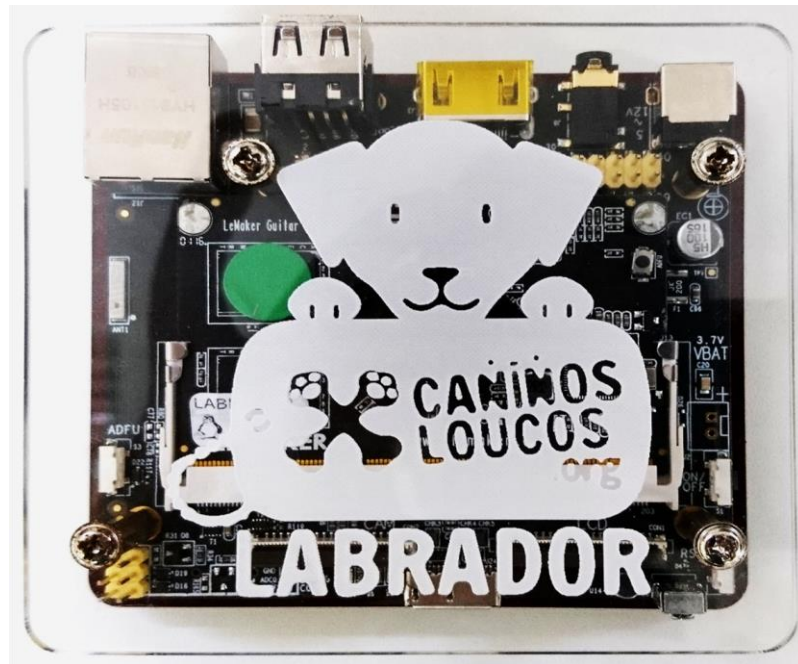
National Open Single Board Computers Program

Reference platforms for Edge Computing

Open and national design to be integrated to the Brazilian products

Mission

- Leverage the national Engineering
- Achieve the trade balance equilibrium
- An Official Program executed by LSITEC

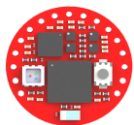


The Caninos SBC Family

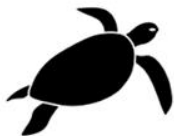
Tiny



Caninos Pulga



- penny size
- autonomous
 - low-power
 - energy harvesting
- wireless communication
- encryption support



Mid-size



Caninos Labrador



- credit-card size
- PC-equivalent processing power
- general purpose computing
- audio and video processing
- high bandwidth communication



High-end



Caninos Bankhar

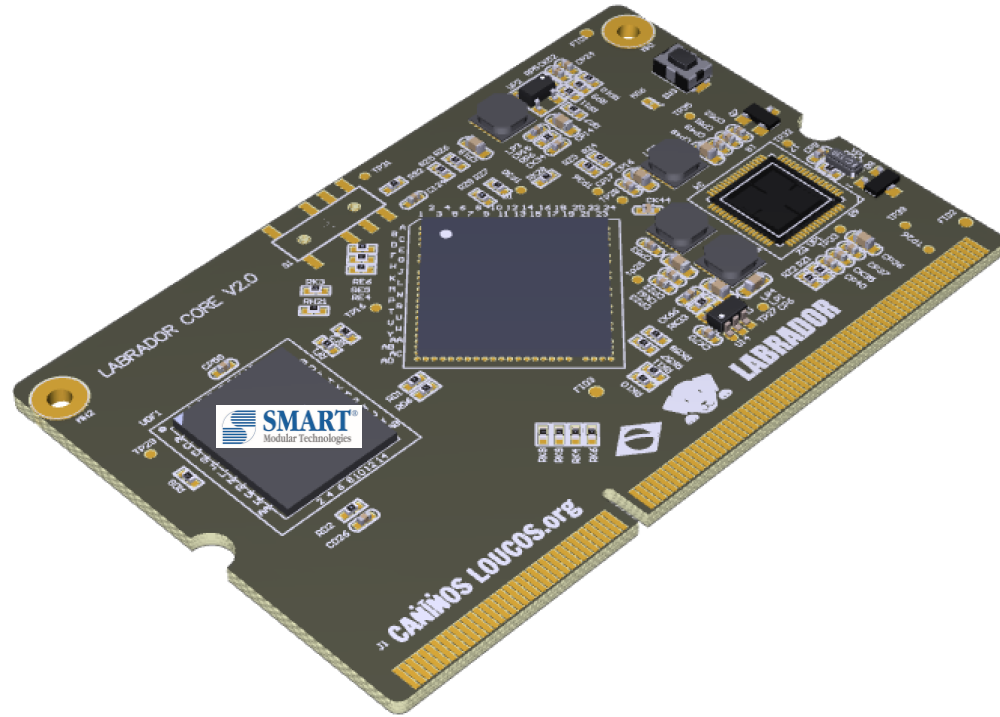


- no-size restrictions
- high performance computing
- programmable co-processing
- multiple channel communications



Labrador project status

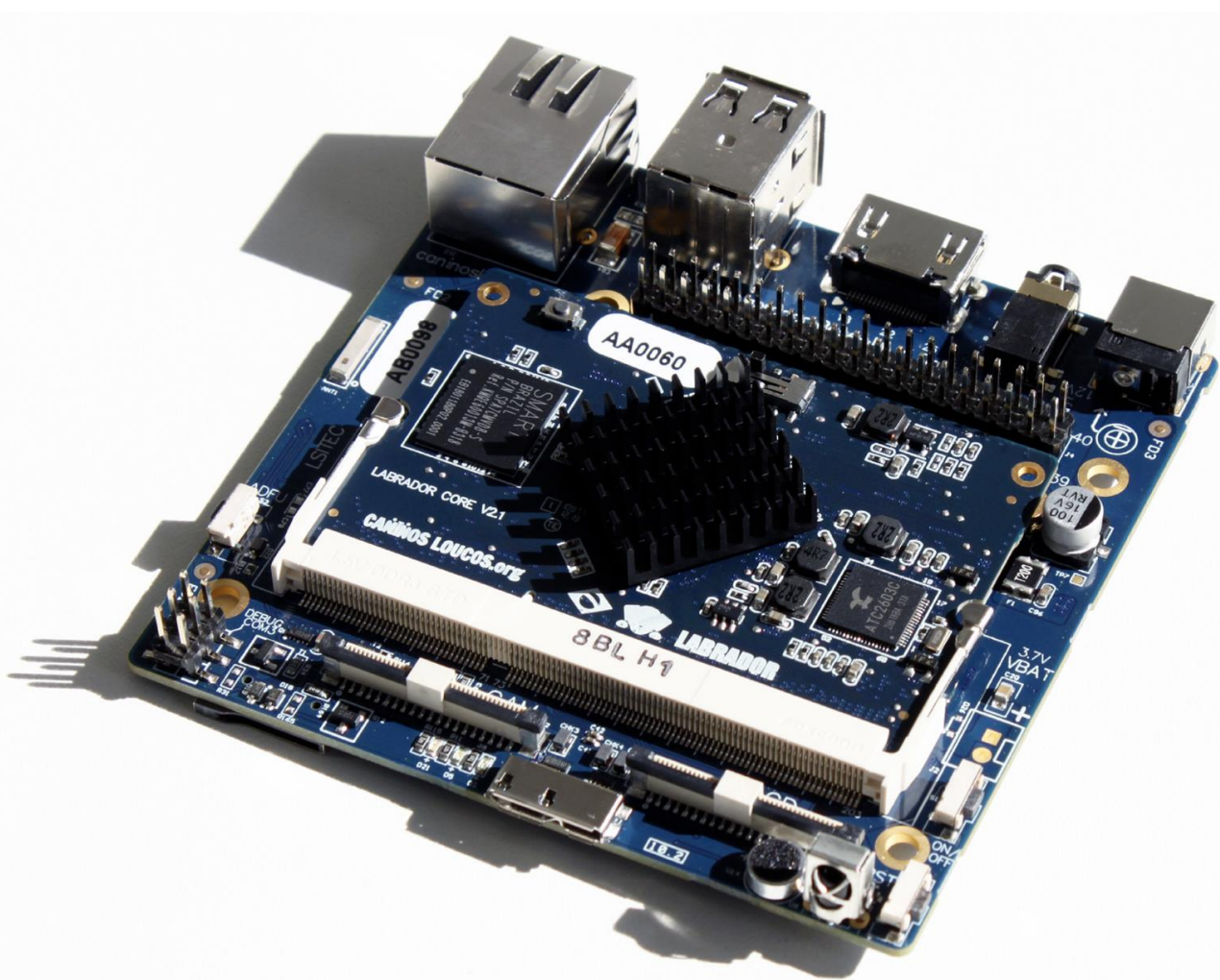
- Contract
- Kick off
- Specifications
- Schematics
- Layout
- Prototype validation
- Pilot batch production



Manufatura Eletrônica – CITI-USP

Concepção, Planejamento e Desenvolvimento.







INSPIRE
Ventilador Pulmonar
Aberto de Baixo Custo



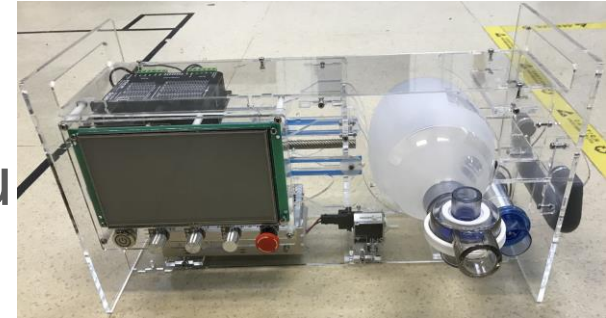
The INSPIRE Ventilator

Open Hardware Challenges and Opportunities during the Covid-19 Pandemic

www.poli.usp.br/inspire

PSI 3221 Introdução à Eletrônica

Escola Politécnica
Universidade de São Paulo
May 2021



Who are we



Marcelo Zuffo

INSPIRE project
coordinator

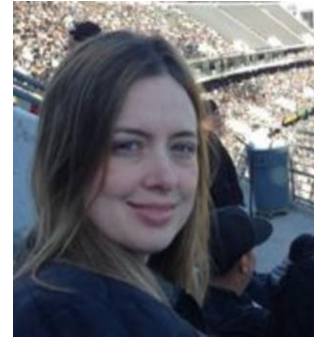
Professor at Electrical
Engineering at University
of São Paulo in Brazil



Raul Lima

INSPIRE project
coordinator

Professor at Mechanical
Engineering at University
of São Paulo in Brazil



**Laisa Caroline C. De
Biase**

Caninos Loucos Chief
Scientist

R&D Coordinator Caninos
Loucos in São Paulo in
Brazil



Catherine Pancotto

Caninos Loucos Chief
Designer

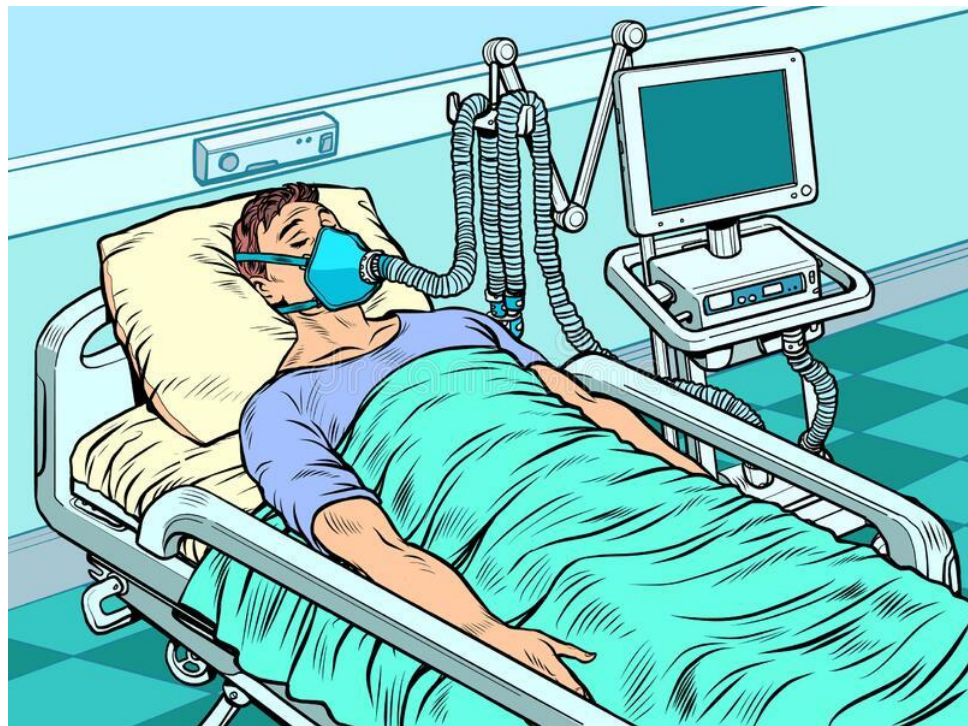
R&D Coordinator Caninos
Loucos in São Paulo in
Brazil

Context

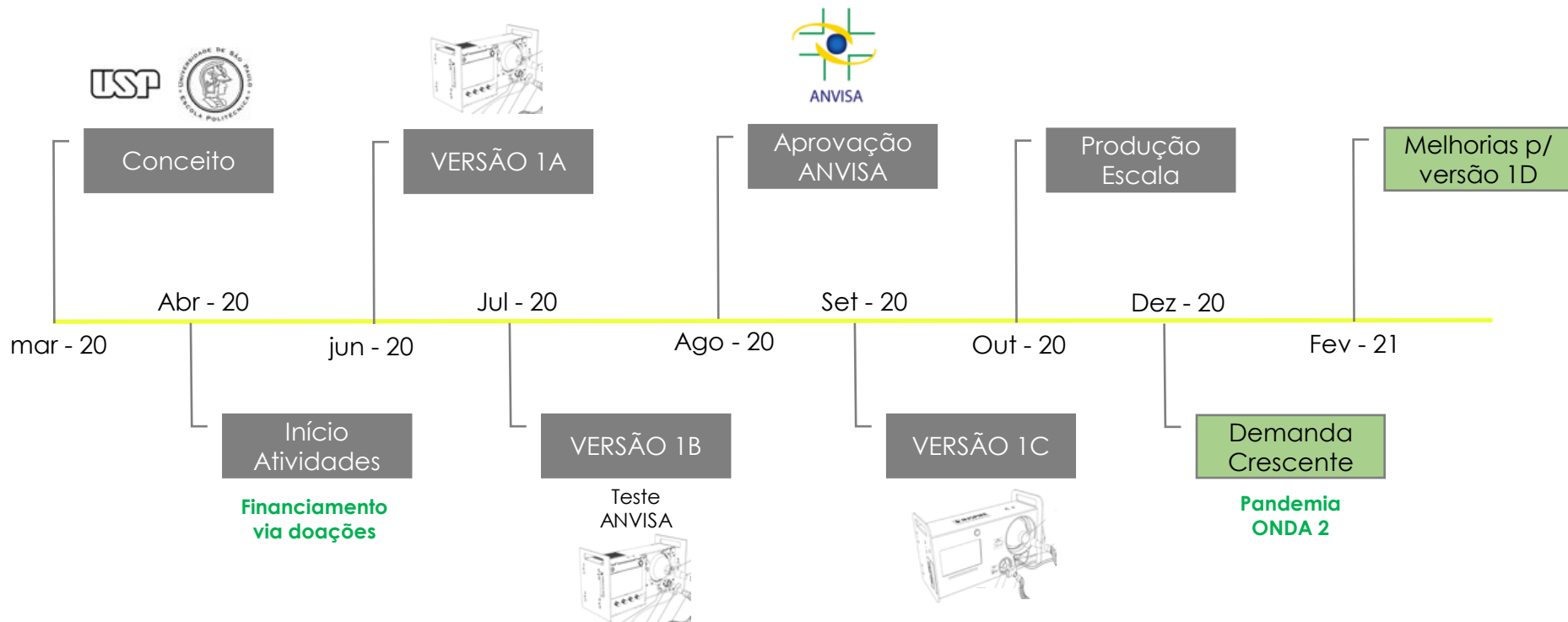
A lung ventilator, mechanical artificial lung ventilator, respirator, or simply **ventilator** is a machine that supports the patient's breathing. These machines are used mainly in hospitals.

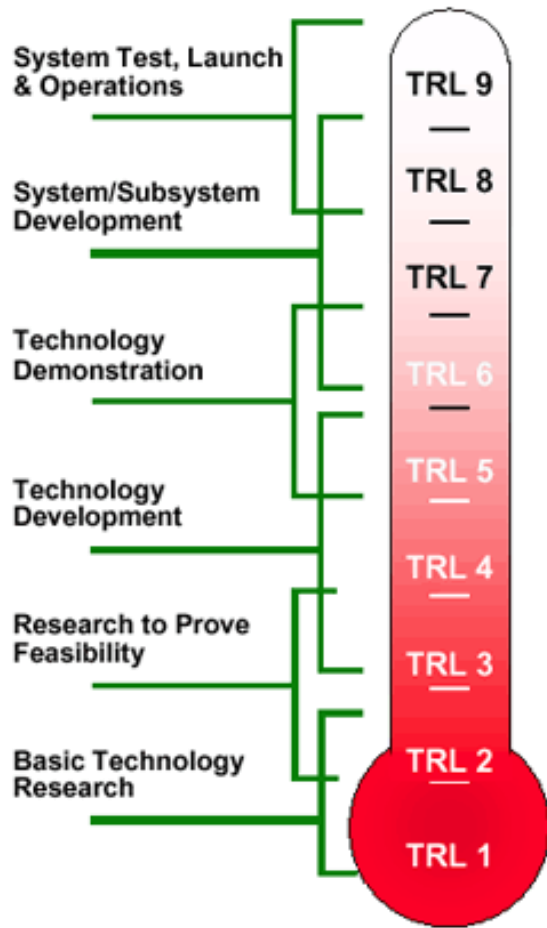
The **high mortality rate** of COVID-19 pandemic is associated with a secondary condition, **ARDS - Acute Respiratory Distress Syndrome**, that demands precise protective pulmonary maneuvers promoted through lung ventilators.

on March 2020, we observed Health System Collapses around the world were the need of Ventilators are Dramatic



Timeline do Projeto





October Fabrication and Distribution

August ANVISA Approval

16th July Human Tests Inco¹

13th April Animal Tests

15 March – Início do Projeto



<https://agencia.fapesp.br/ventilador-pulmonar-desenvolvido-na-usp-comeca-a-ser-utilizado-no-incor/33654/>

III - Ficha Técnica – Inspire V1.C

Tipos de funções disponíveis:

- 1) PCV *Pressure Controlled Ventilation*,
- 2) VCV *Volume Controlled Ventilation*,
- 3) PCV Assisted



Interface interativa

Tela de 7" Sensível a Toque de Alta Resolução

Instruções intuitivas gravadas em UV

Gabinete Ergomômico em Alumínio Anodizado 5MM e Plástico

Suporte a AMBUs de vários Fabricantes

Alça de Transporte Ergonômica

Válvula PEEP Digital

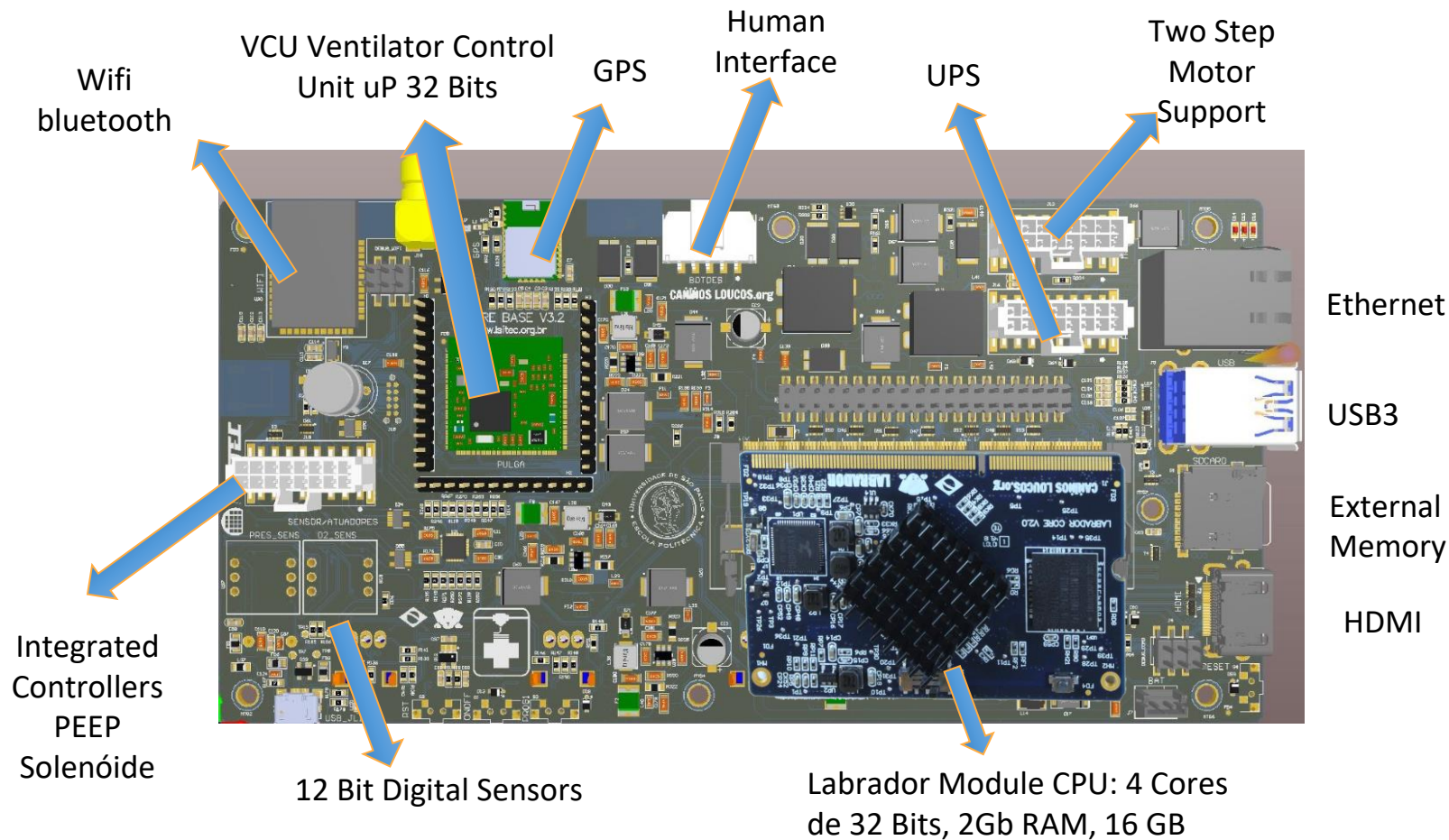
Alarmes Visuais e Sonoros

Válvula de O2 de Alta Precisão

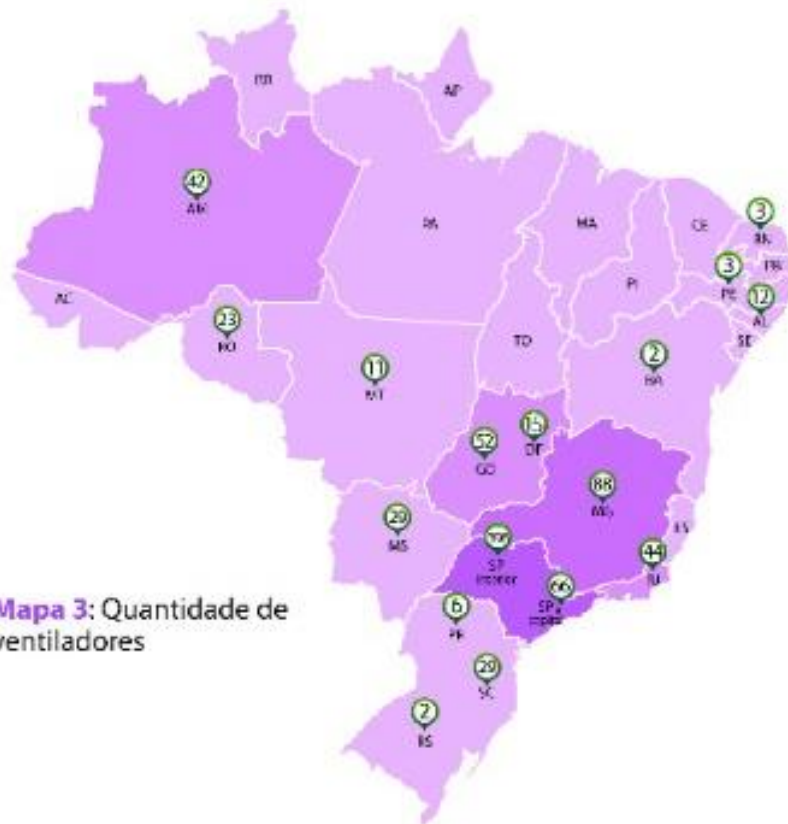
Sensor de Pressão de Alta Precisão



Inspire Base V3.2

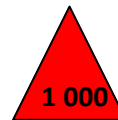


VI – Mapa de Distribuição dos Ventiladores Outubro de 2021



UF	Número de municípios atendidos	Número de hospitais	Quantidade de ventiladores
SP capital	1	8	66
SP interior	107	110	398
AL	5	6	12
AM	2	13	42
BA	1	1	2
DF	1	1	15
GO	13	13	52
MG	26	26	88
MS	12	12	29
MT	2	2	11
PE	1	1	3
PR	2	2	6
RJ	3	3	44
RN	1	1	3
RO	11	11	23
RS	1	1	2
SC	8	8	29
16	197	219	825

175 Estoque
Estratégico
USP/Marinha





The Swarm OS

Internet of Things R&D Overview

SwarmOS Research Group at
CITI- USP

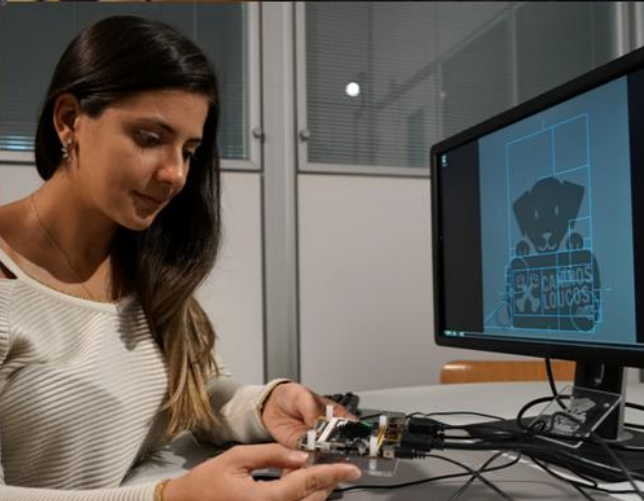
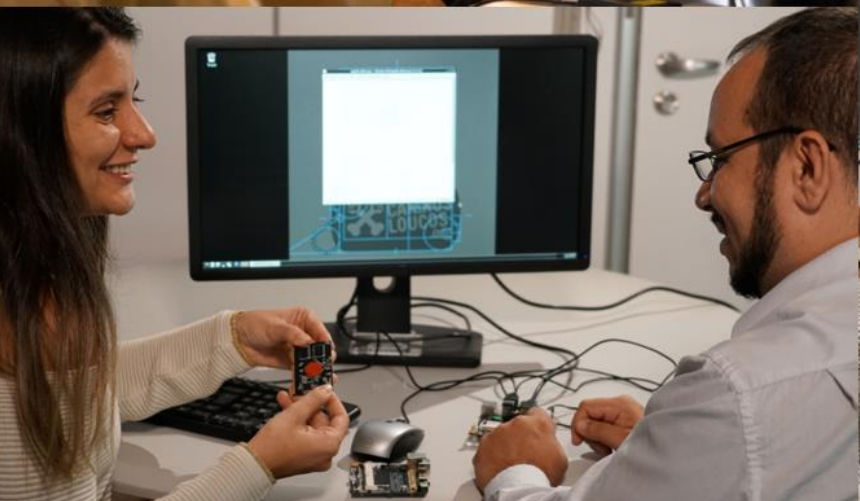








building a collective organic intelligence



Thank you!

