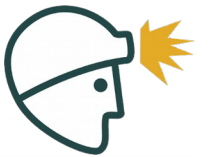


# Introduction



**WSCF 2019**  
CYBER PHYSICAL SYSTEMS WORKSHOP





# Outline

- Objectives
- Software and hardware
- Schedule



# Objectives

- Build a IoT node
  - Includes sensors and actuators
  - Communicates with LoRaWAN
- Process received information using Node-Red
- Develop a small complete IoT project



# Software

- Whitecat IDE
  - Lua RTOS
  - Blocks Language
- ZeroBrane Studio
- Terminal emulator program
- Whitecat Console (wcc, command line tool)
- ChirpStack Server
- Node-Red

# Hardware

- Sparkfun ESP32 LoRa
- Sensors
- Actuators





# Day 1

- Introduction
- Lua RTOS and Lua language (Jorge Visca)
- Introduction to LoRaWAN (Germán Capdehourat )
- First steps on using Lua RTOS



# Day 2

- Introduction to microcontrollers
- Introduction to ESP32
- Introduction to I/O
- Hands-on sense and act



# Day 3

- Introduction to sensor networks (Leonardo Steinfeld)
- Hands-on LoRa transmissions
  - Transmitting in the ESP32
  - ChirpStack configuration and usage





# Day 4

- Processing information using Node-Red
- Decide and start project

# Day 5



- Continue with project



# Questions