Zephyr Project Meetup

February 12, 2026

5:00 PM - 9:00 PM

Winterthur, Switzerland

Event Hosts: NOSER ENGINEERING, zhaw

WLAN-Name: **guest-ZHAW**

Access-Code: **253837**

Image Winterthur: Ivo Scholz

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Welcome to the Zephyr Project Meetup Winterthur

NOSER ENGINEERING

Dr. Michael Eisenring
Head Business Unit Embedded Systems

zh aw

School of Engineering

Institute of Embedded Systems

Prof. Andreas Rüst
Head of Institute of Embedded Systems

School of Engineering
Institute of Embedded Systems

Zephyr in Research and Education

Institute of Embedded Systems
February 12, 2026 | Prof. Andreas Rüst

image source: https://www.zephyrproject.org

Industrial Partners & Students Search Vendor Independent Expertise

ZHAW – Institute of Embedded Systems (InES)

Research

Embedded Processing and Communication

- Research projects
- System concepts and feasibility studies
- Design of Hardware and Firmware
- Evaluation of technologies and components
- Proof-of-concepts
- Reference implementations

Education

Bachelor and Master, Continuing Education

- Degrees in Computer Science, Electrical Engineering, Systems Engineering
- Broad spectrum of introductory and advanced courses
- Lectures and labs
- Student projects and theses
- Continuing education (for university graduates)

How to Leverage Embedded Expertise for so Many Application Fields?

Application Expertise

- Smart Cities
- Infrastructures
- Buildings
- Logistics / Supply
- Manufacturing
- Agriculture
- Health
- Avionics
- ….

Industrial Partners
Other Research Entities

Embedded Expertise

More than 60
Employees at InES

Diverse microcontrollers: Vendors, cores, peripherals, power-down modes

Services like threads, synchronization, messaging, Secure Boot, Secure Storage, Logging, File System, …

External chip devices from numerous vendors: Sensors, memories, Secure Elements, RTCs …

Wired and wireless communication interfaces like ble, 802.15.4, WiFi, Ethernet, LoRaWAN, NFC, NB-IoT

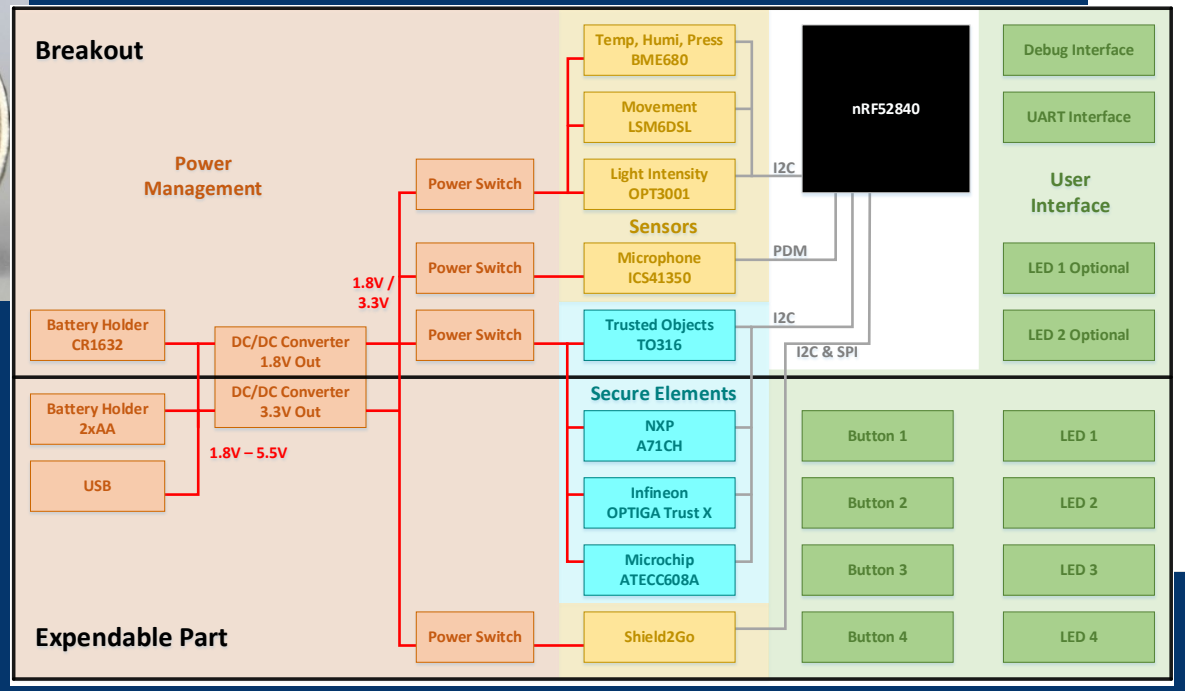
Communication stacks and processing libraries

The Plan: Find a Universal System to Build Individual Variations

Can Zephyr Be the Swiss Army Knife We Are Looking For?

Master Thesis by Benjamin Häring

Low power, secure IPv6 Sensor Node based on OpenThread



School of Engineering
InES Institute of Embedded Systems

Zephyr 1.14.0

Consolidating IoT Firmware Architectures with Zephyr

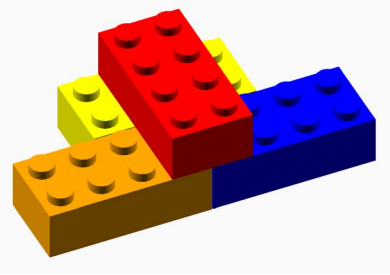
Zurich University of Applied Sciences

Institute of Embedded Systems

Authors	Benjamin Häring
Supervisor	Prof. Andreas Rüst
Version	1.0
Last changes	**May 31, 2019**

Plus demos on Nordic, STM32 and NXP Evalboards

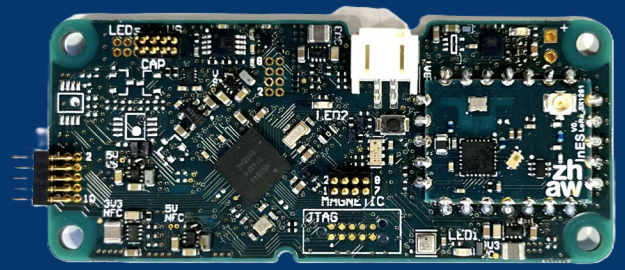
Research: Recent Example I



Monitoring Olive Oil

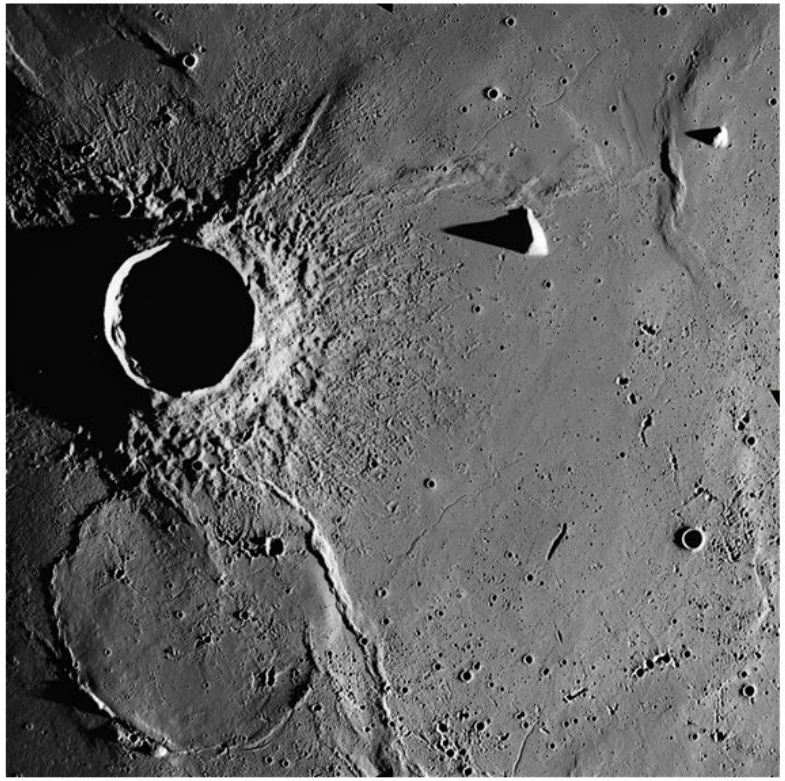
Firmware for sensors, edge processing, NFC and LoRaWAN communication runs on Zephyr

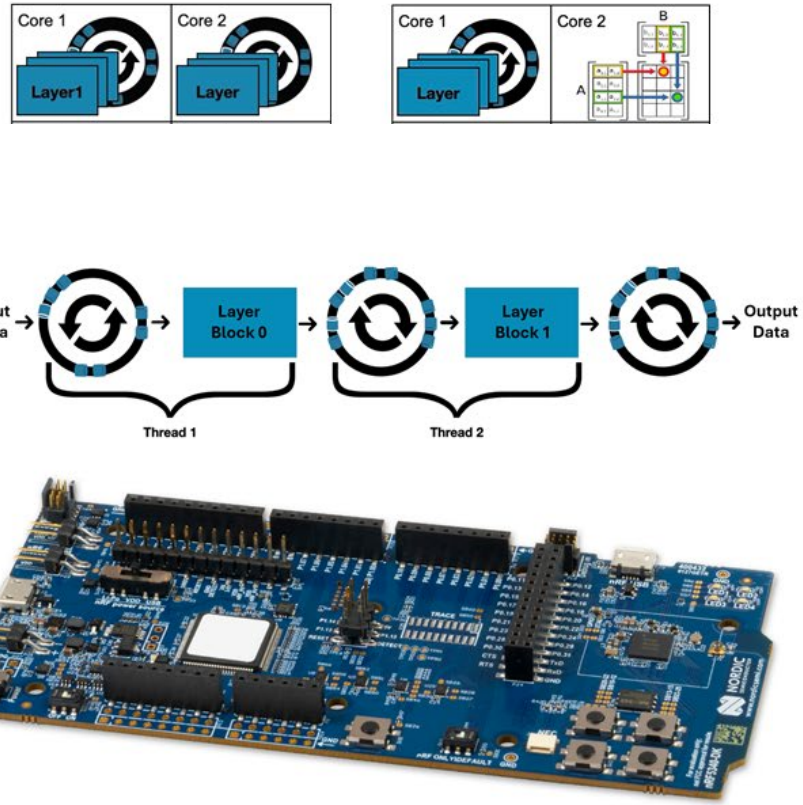
Eat well, Do good
AMFORA
AMFORAHOME.CH



INNOSUISSE: IOTA: Internet of Things - Amfora. A Swiss Digital Solution for Global Foodservice

Research: Recent Example II
Dependable/Power-efficient AI on Highly-constrained Systems



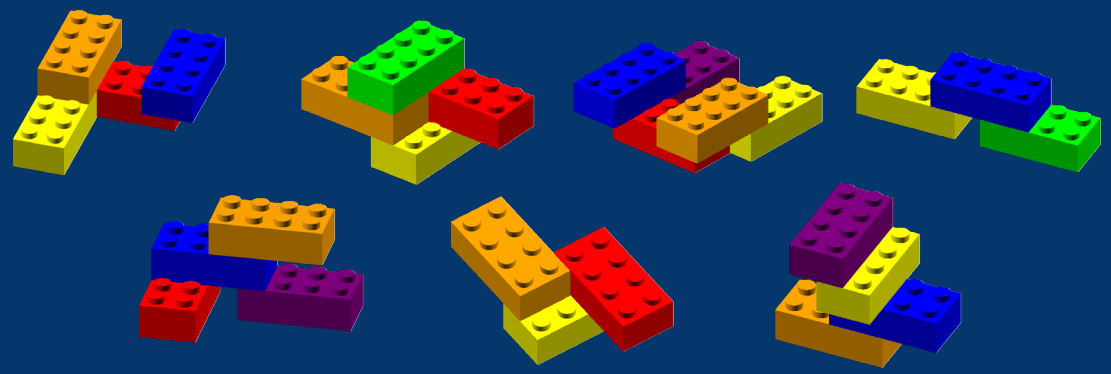


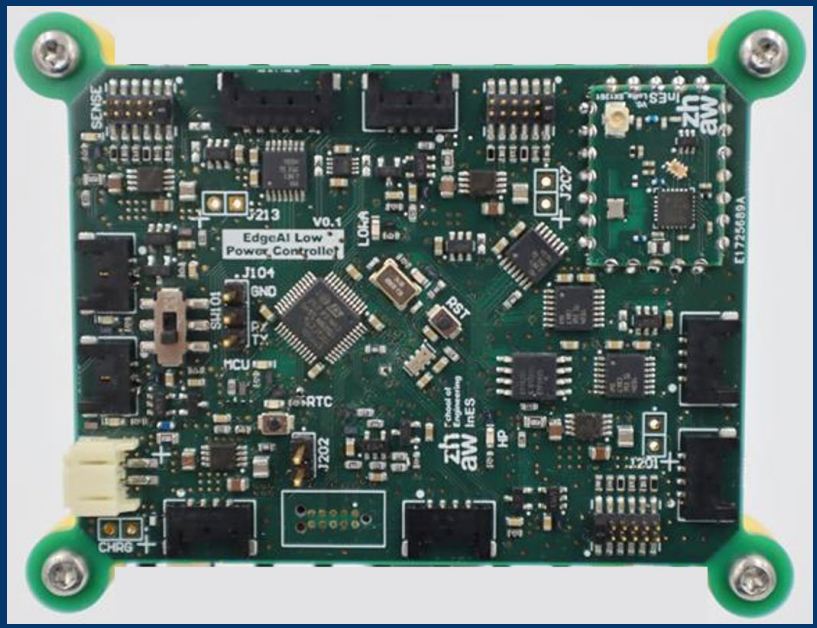
Demonstrate the software AI orchestration for the use case of a moon landing on a dual core using Zephyr.

See More of Our Projects at the InES Booth

Here at the Zephyr Project Meetup

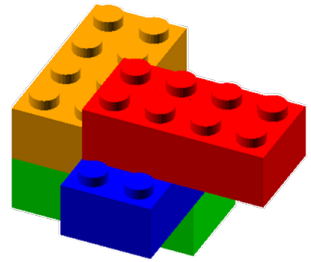
Seven projects on display





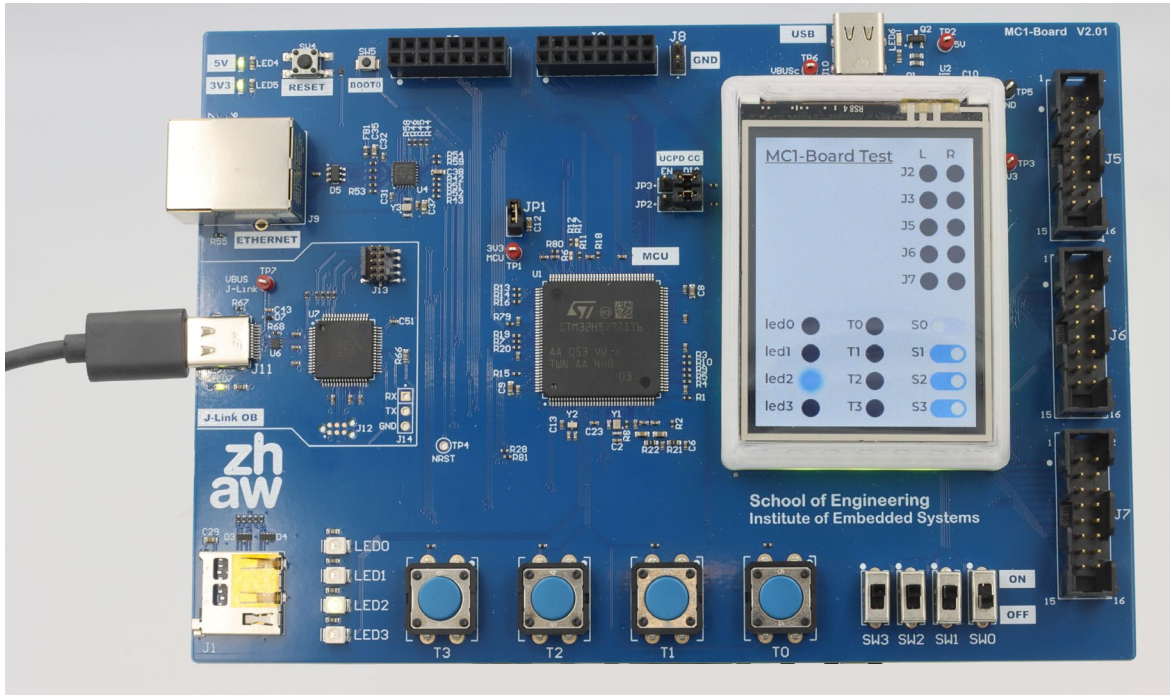
Running on Analog Devices, Nordic, NXP, Raspberry Pico, STM

Education Example



Microcomputer Systems 1 (MC1)

- Advanced course in Bachelor program
- 5 out of 14 weeks based on Zephyr 4.2
  - Threads and interthread communication
  - ZTest
  - Secure Boot
- Zephyr was introduced 3 years ago
- Every year we are extending the Zephyr part

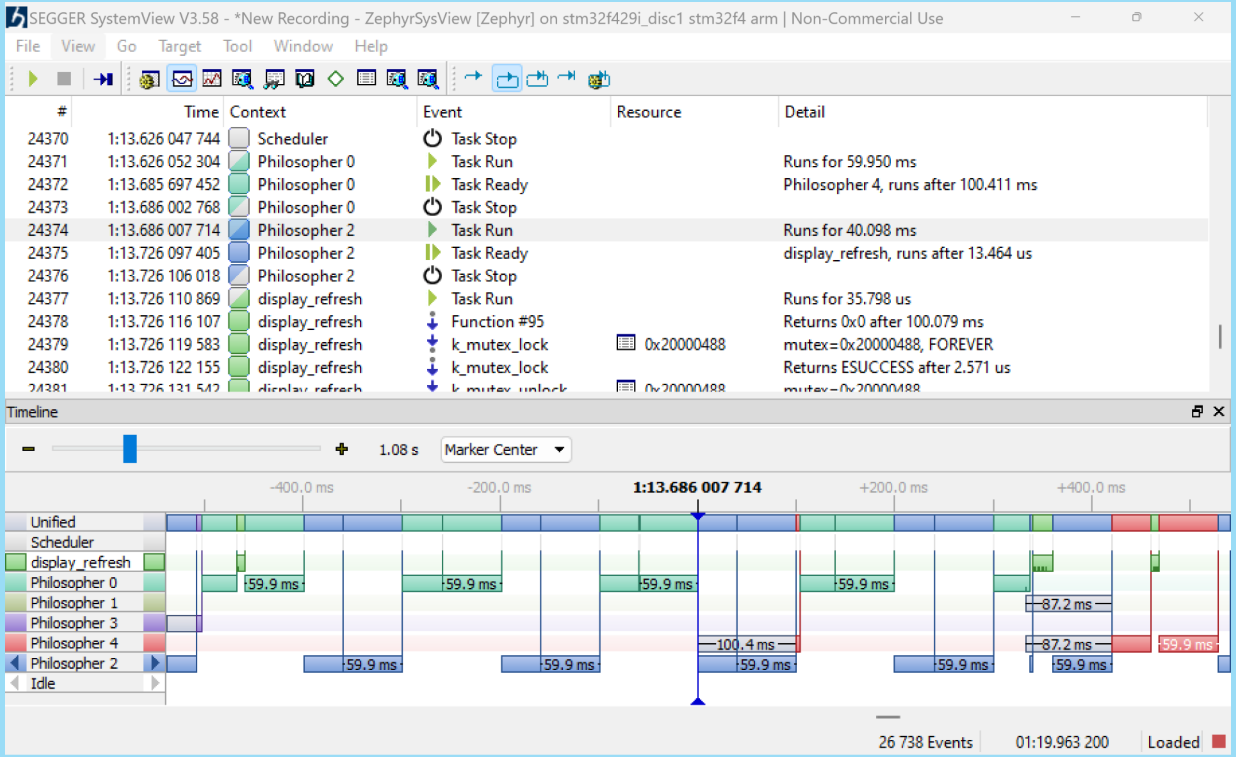


Labs are done with the MC1 board designed by ZHAW-InES.
Based on STM32H5

We are NOT teaching Zephyr, but

– we are using Zephyr as a platform to teach Embedded Systems

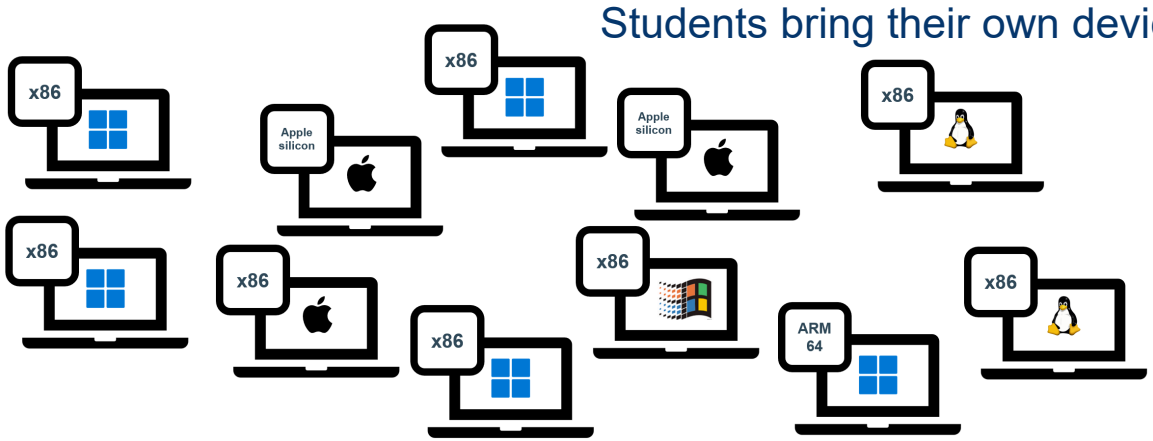
– Enable fast learning progress



Experiencing real time effects in the Masters course Embedded Realtime

Education: Time in the Labs Is Limited

Do not waste it on the installation of tools.



Development Environment for Students

- Works on Windows, macOS and Linux
- Uniform and reproducible
- Easy to maintain
- Easy and quick to set up, easy to use

Customized, lean containers

Load with WSL2 (Windows) or Podman (macOS, Linux)

WSL: Windows Subsystem for Linux

- **Import file system as WSL2 distro on Windows**

```
mkdir "C:\WSL\zephyr_v4.2.0"
wsl --import zephyr_v4.2.0 "C:\WSL\zephyr_v4.2.0" `
  zephyr_nrf_v4.2.0_wsl.tar.zst
wsl -d zephyr_v4.2.0
```

ZiSE 2025
1. International Conference on Zephyr in Science and Education

Zephyr Development Environment for Students

Johannes Witzig[1], Flavio Felder[1], Vixay Phimmasane[1], Simon Künzli[1*] and Andreas Rüst[1]

[1]*Institute of Embedded Systems, Zurich University of Applied Sciences, 8401 Winterthur, Switzerland*

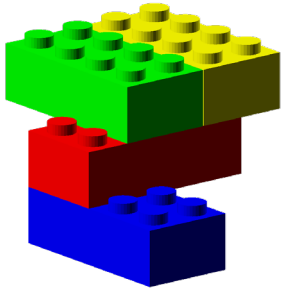
Abstract

The Institute of Embedded Systems at the Zurich University of Applied Sciences uses Zephyr both in research projects and for several lab exercises for BSc, MSc, and students in continuing education. These labs include topics like embedded security, bootloaders, and general operating system concepts. In this paper, we discuss the challenge of providing a uniform Zephyr development environment that can be set up quickly and reliably.

Keywords

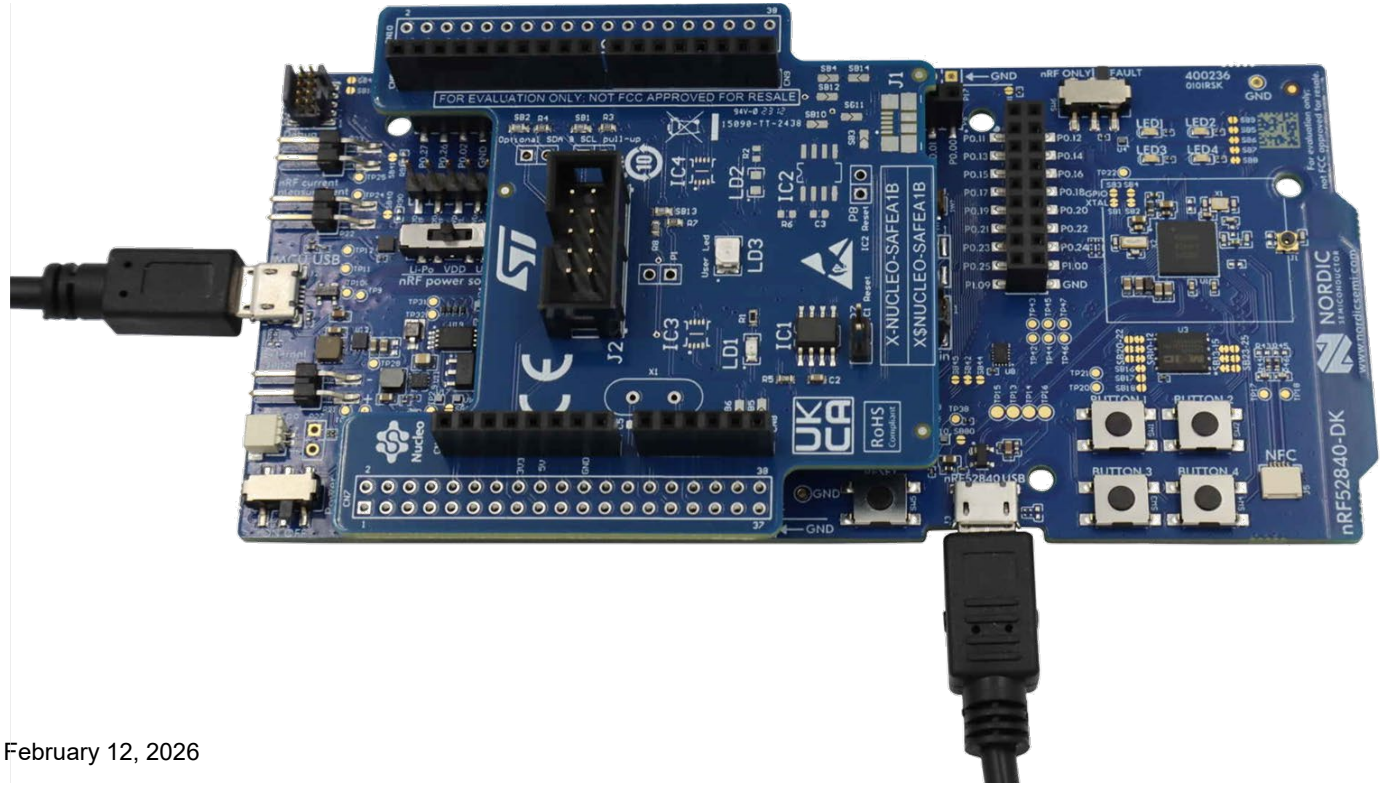
container, development environment, education, WSL, Zephyr, ZHAW

Continuing Education – WBK Security in Embedded Systems



- EU Cyber Resilience Act (CRA)
- Knowledge and tools for implementing security measures in networked devices with limited resources
- By Dr. Simon Künzli

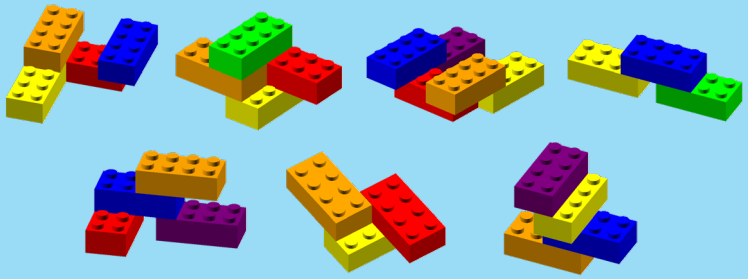
Among others, enjoy hands-on labs with the STSAFE-A110 secure element



Zephyr Is the Swiss Army Knife

Research for Industrial Partners

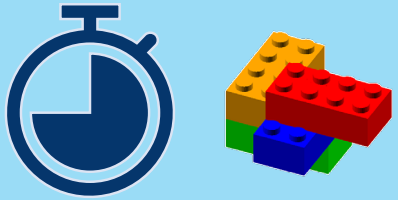
- Fast prototyping
- Reuse
- Maintainable
- Variety



→ Numerous projects, many MCU vendors, countless external devices and communication interfaces, multiple protocol stacks, several papers

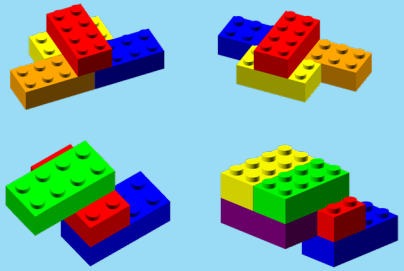
Education Modules

- Lectures and Labs
- Zephyr as a platform to teach Embedded Systems
- Customized, lean containers
- Enable fast learning progress



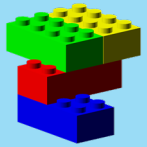
Student Projects and Theses

- Flying start, do not start from scratch
- Benefit from and stimulate research projects
- Supported by the Zephyr community at InES



Continuing Education

- Provide hands-on training
- E.g. in Embedded Security
- Leverage expertise from research projects



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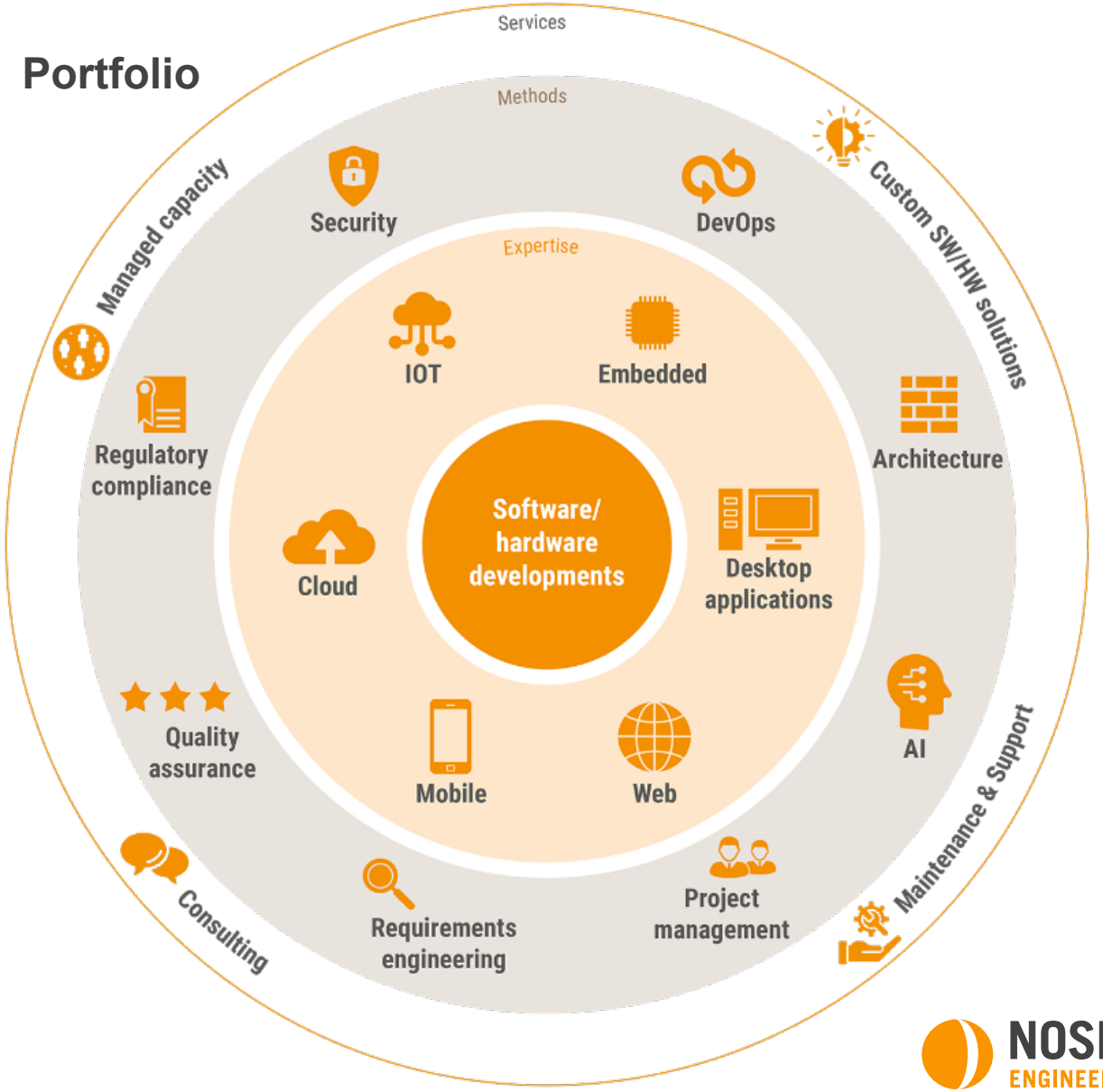
Noser Engineering AG

Dr. Michael Eisenring
Head Business Unit Embedded Systems

«We drive innovation through technology we know how.»

Portfolio



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Program

5:00 pm – 5:30 pm – Welcome snacks & drinks

5:30 pm – 5:50 pm – Welcome note & lightning talk on Zephyr in Research and Education: Prof. Andreas Rüst, Institute of Embedded Systems

5:50 pm – 6:10 pm – Rust with Zephyr: An Overview: Dr. Andreas Nussberger, Noser Engineering

6:10 pm – 6:30 pm – Zephyr Optimisations: through the looking ~glass~ code: Loic Domaigne, Doulos GmbH

6:30 – 6:45 pm – Real-Time Isn't Optional: How Zephyr Guarantees Safety at Racing Speeds: Jil Zerndt, Zurich UAS Racing

6:45 pm – 7:15 pm – Break time – Pizza, Board giveaways

7:15 pm – 7:35 pm – How to Out Of Tree a Trusted-Firmware-M (TF-M) board for the STM32U5Axx MCU: Gerson Budke, Leica Geosystems AG

7:35 pm – 7:55 pm – Replacing CAN: How Single-Pair Ethernet and TSN Enable the Next Generation of Embedded Systems: Kilian Brunner, ZHAW Institute of Embedded Systems

7:55 pm – 8:15 pm – Audio-over-Ethernet using Zephyr: Peter Büchler, Noser Engineering

8:15 pm onwards – Networking, Board giveaways

Boards giveaway at Noser and InES Booth

Solve the riddle on the Luma Matrix

Win a board ☺

Board Sponsors:

STMicroelectronics

NXP

MICROCHIP

Let’s meet at the Apéro!

We are interested in your feedback!

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