



▶ OPEN-SOURCE RESILIENT HARDWARE AND SOFTWARE FOR INTERNET OF THINGS

HOW TO DESIGN EMBEDDED AND CONNECTED
DEVICES TAKING ADVANTAGE OF OPEN SOURCE
HARDWARE (AND SOFTWARE) ▶



ORSHIN



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the European Union

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About

Cybersecurity is becoming increasingly important in our private lives, industrial control and critical infrastructure. It is therefore essential to strengthen the security of for example small embedded and connected devices.

Embedded devices such as IoT and IIoT are currently built using closed-source hardware components combined with open-source or closed-source software. However, next-generation embedded devices will integrate open-source hardware (OSH) parts such as RISC-V processors, IP cores or secure elements. This OSH revolution brings new challenges and opportunities to create dependable embedded devices such as wearables and industrial controllers.

ORSHIN is creating the first generic and comprehensive methodology for developing secure connected devices based on open-source components and for managing their entire lifecycle. This methodology is called the trusted life cycle. It consists of different phases (design, implementation, evaluation, installation, maintenance and retirement) that form a chain of trust. The trusted life cycle defines how the security objectives are translated into policies for the phases and subsequently into concrete security requirements for the building blocks of the product. Using this holistic view, ORSHIN will address critical links to reduce the security threats associated with open-source connected devices.





Vision

Our vision is to leverage the open-source hardware revolution to improve the security and privacy of OSH devices with an emphasis on IoT and IIoT markets. We will provide a methodology to develop and manage dependable OSH products. We will improve the testability of a device by taking

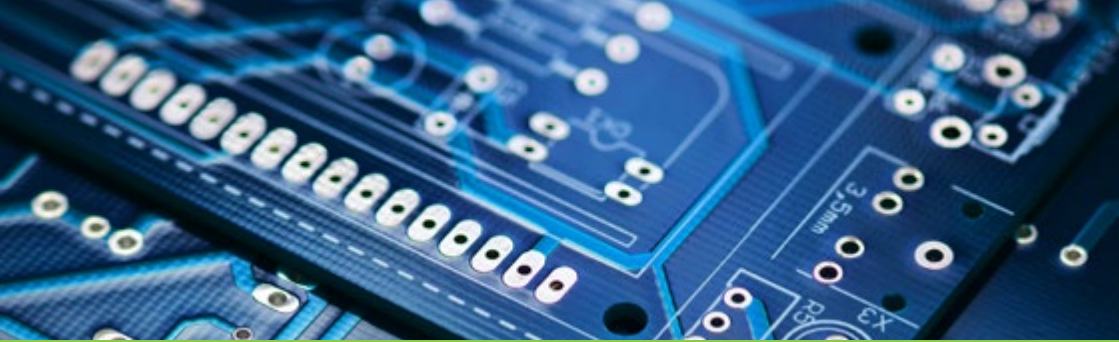
advantage of OSH. We will develop secure communication protocols based on open-source hardware components. We will build formally-verifiable and open-hardware building blocks.



Motivation

There is yet to be a standard methodology to develop and manage a secure and privacy-preserving OSH device. On the other hand, security and privacy incidents related to embedded devices are very frequent and have concrete consequences for the target

devices and users. Furthermore, current IoT and IIoT devices do not take advantage of formally verified OSH components, OSH-augmented testing techniques, and OSH-aware communication protocols. ORSHIN will address these critical gaps.



Mission & Objectives

ORSHIN's mission is to provide usable solutions to build trustworthy embedded devices by leveraging

the OSH revolution. In particular, ORSHIN will focus on the following objectives:

- ▶ Definition of a methodology, called the trusted life cycle, to build embedded devices with OSH components;
- ▶ Enabling, supporting, and improving the formal verification of security properties of OSH components;
- ▶ Design of effective security audits for OSH devices;
- ▶ Development of efficient, secure, and privacy-preserving protocols for OSH devices;
- ▶ Creation of demonstrators for the developed methodologies and techniques.

Partners

The ORSHIN consortium consists of seven partners from six different countries (Austria, Belgium, Czech Republic, France, Germany, and Italy). It consists of a well-balanced mixture between academic and industrial players, from large semiconductor to small SMEs.



1 TECHNIKON

TECHNIKON FORSCHUNGS-
UND PLANUNGS-
GESELLSCHAFT MBH
Austria [Villach]

2 KU LEUVEN

Katholieke Universiteit Leuven
BELGIUM [Leuven]

4 NXP

NXP Semiconductors Germany
GmbH,
GERMANY [Hamburg]

6 Texplained

HARDWARE SECURITY INSIGHT

Texplained
FRANCE [Valbonne]

3 EURECOM

EURECOM, FRANCE
[Sophia Antipolis]

5 SECURITY PATTERN

Security Pattern Srl
ITALY [Burago di Molgora]

7 tropic square

Tropic Square s.r.o.
CZECH REPUBLIC [Prague]

Facts



Budget

€ 3.8 Million

100% EU-funded



Consortium

7 Partners

6 countries



Duration

36 Months

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Contact

Technical Lead

Daniele Antonioli

Eurecom
France

Scientific Lead

Benedikt Gierlichs

KU Leuven
Belgium

Project Coordinator

Barbara Gaggl

Technikon Forschungs- und
Planungsgesellschaft mbH

Burgplatz 3a
9500 Villach
Austria

coordination@horizon-orshin.eu



Find out more about this Project:
<https://horizon-orshin.eu/>