



bugseng

SOFTWARE
VERIFICATION
DONE RIGHT



bugSeng

- About the company
- What are we known for
 - Services & Products

eclair

- Quick focus on the tool
- ECLAIR FuSa Ecosystem



About BUGSENG

Founded in 2010 as a spin-off of the University of Parma

BUGSENG designs and delivers **tools** and **services** for **automated software verification** and **security testing**

While maintaining a strong connection with the world of scientific research, BUGSENG addresses the **safety-** and **security-critical** software industry

BUGSENG solutions have been selected to support projects such as *Trusted Firmware* and *Zephyr RTOS*



BUGSENG

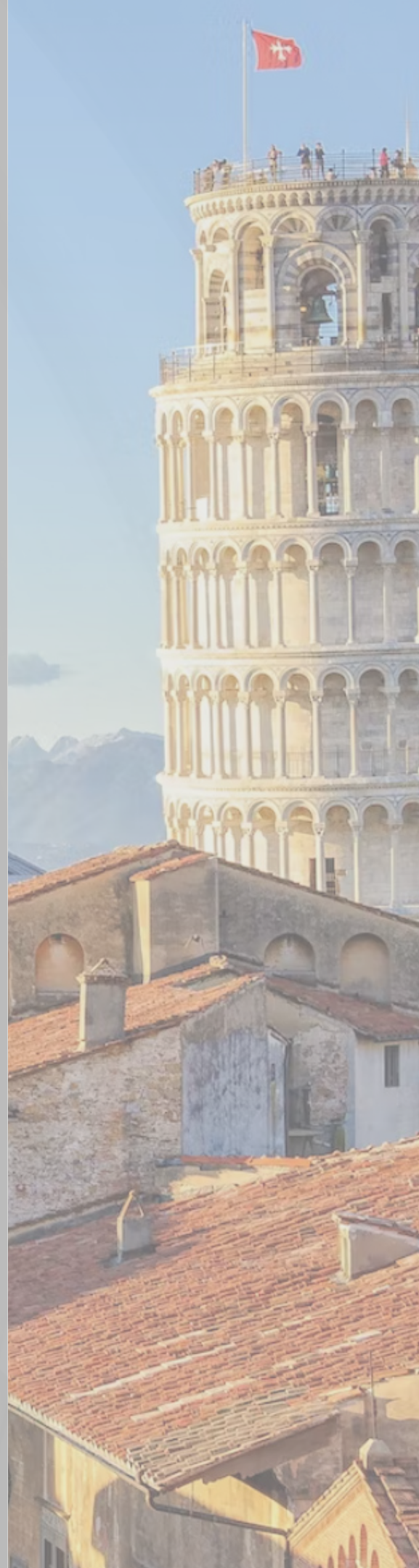
BUGSENG team is composed of highly skilled researchers and software engineers with 25+ years of experience in software verification, static analysis, language and coding standards, including MISRA

Headquarters in Parma

Via Marco dell'Arpa 8/B
I-43121, Parma (PR)
Italy

Pisa site

Via Fiorentina 214/C
I-56121, Pisa (PI)
Italy



Team Memberships

- 
- ▶ **MISRA C Working Group:** the international working group in charge of the evolution of MISRA C
 - ▶ **MISRA C++ Working Group:** the international working group in charge of the evolution of MISRA C++
 - ▶ **ISO/IEC JTC1/SC22/WG14:** the international standardization working group for the programming language C
 - ▶ **UNINFO:** the National Standardization Body for Information Technologies and their applications



BUGSENG is known for

Training

Consulting

eclair

PPL



Training

Shift left starts here

Effective MISRA C

A professional training course on **MISRA C:2012 Revision 1**, including the latest amendments and addenda.

The course has been designed for the smooth and successful adoption of MISRA C into an organization.

MISRA Compliance for PMs

A professional training course for all project managers involved in the negotiation, planning, execution and assessment of **MISRA requirements**, with compounding benefits for the entire organization.



Consulting

E.g., bringing existing projects into MISRA compliance, development and verification of safe and secure software, integration of software verification tools into complex CI/CD infrastructures

Two Successful Customer Stories



Compliance with MISRA C and MISRA C++
of an existing safety-critical project:
from ~100,000 to ~250 violations



Compliance with MISRA C of
zephyr-v2.7-auditable branch:
from ~500,000 to
less than 10,000 violations



BUGSENG is known for

In 2022, ECLAIR has been chosen as the solution for C.I. systems of *Trusted Firmware*, which provides the most critical implementations, for safety and security, for processors implementing A-Profile and M-Profile Arm® architecture

The logo for Eclair, featuring a stylized 'E' in a circle followed by the word 'clair' in a bold, red, sans-serif font.

Among its members: Arm, Google, ST Microelectronics, Cypress, Linaro, NXP, and Renesas



ECLAIR Software Verification Platform®
is designed to help development, QA, and
safety teams reach their quality goals

Supported Applications

- ▶ Automatic checking of coding standards
- ▶ Bug Finder
- ▶ Metrics
- ▶ Automatic verification of independence and freedom from interference



Features Common to all ECLAIR Applications

- ▶ Uniform user experience whether ECLAIR is used from the GUI, from the command line, within IDEs, in CI systems like Jenkins and GitLab
- ▶ Proper integration with the toolchain: no need to worry about the hundreds of C/C++ implementation-defined aspects
- ▶ Advanced reporting facilities: integrated browser, HTML, ODT, Word, Excel, pure text



ECLAIR Software Verification Platform®
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safety teams reach their quality goals

You can use it

- ▶ From your desktop (GUI, command line, IDE)
- ▶ In C.I. with Jenkins, GitLab, GitHub, etc.
- ▶ Even without any hardware (SaaS)



See how it works on
<https://eclairit.com>



ECLAIR Packages

B

ECLAIR B package is bundled
with all MISRA packages

- BARR-C:2018
- AUTOSAR C:2009
- HIS metrics
- Bug finder
- Dozens of other services and metrics
- Project Organization Checker

MC2

MISRA C:2004

MC3

MISRA C:2012

MP1

MISRA C++:2008



ECLAIR is Certified

ECLAIR Software Verification Platform® is certified by TÜV SÜD Rail GmbH according to:

- **ISO 26262** (automotive) up to ASIL D
- **IEC 61508** (industrial) up to SIL 4
- **EN 50128** (railway) up to SIL 4
- **IEC 62304** (medical) up to Class C
- **ISO 25119** (agriculture and forestry) up to SRL 3



Functional Safety Ecosystem



- **ECLAIR Qualification Kits**, with extensive documentation, test suites and test automation for all functional safety standards, including RTCA DO-178C/DO-330
- **ECLAIR Qualification Service**, whereby BUGSENG highly-qualified personnel join forces with customers' safety teams in taking care of ECLAIR qualification following the prescriptions of functional safety standards
- **ECLAIR FuSa Pack**, consisting of the "ECLAIR Safety and Security Manual" with all information and checklists for the adoption of ECLAIR in safety-related development, and ECLAIR's TÜV SÜD certificate and report



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