ECLAIR Software Verification Suite

Static Analysis Tool

ECLAIR is a powerful platform for the automatic analysis and verification of C and C++ programs, which has been designed at the outset:

- to eliminate error-prone and time-consuming configuration work
- for safety-related development in all industry sectors
- for deployment on PCs as well as on remote CI systems
- to assist design, development, QA and safety teams reaching their goals without unnecessarily constraining their work

Key Features

- Continuous compliance to coding standards

- Automatic toolchain configuration

- Use from GUI, command line, IDE, CI systems

- Compatible with Docker and other virtual environments

- Advanced reporting facilities

- Automatic checking of independence and freedom from interference

- Integrated requirements management tool

- Certified and qualifiable for the main functional-safety standards

Compliance to Coding Standards

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ECLAIR is licensed in packages depending on selected coding standards

B bundled with all MISRA packages

- BARR-C:2018
- AUTOSAR C:2009
- HIS metrics
- Bug finder
- Dozens of other services and metrics
- Independence checker
- Requirements management tool

MC MISRA C:2004 MISRA C:2012
MISRA C:2023 MISRA C:2025

MP MISRA C++:2008
MISRA C++:2023

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Automatic Toolchain Configuration

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ECLAIR is fully integrated with the compiler toolchain: no need to worry about the hundreds of C/C++ implementation-defined aspects

The hardest part of the configuration, namely the adaptation to the compiler and the particular language dialect(s) used in the project, is **fully automatic**

No need to tell ECLAIR where the sources are either: ECLAIR automatically intercepts all toolchain components and it knows first-hand

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Uniform User Experience

Everything can be done from the command line for automation and reproducibility, but a very easy-to-use GUI is available for day-to-day work

The productivity attainable using ECLAIR when interfaced with IDEs leaves competitors far behind
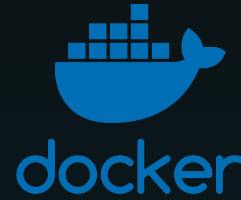
In addition ECLAIR has great support for continuous integration systems such as Jenkins, GitHub and GitLab

Compatible with Docker and other Virtual Environments

No worries if you use virtual environments for your development

ECLAIR perfectly works with:

- Docker containers
- hosted hypervisors (like VirtualBox and VMWare)

ECLAIR fits very well in highly distributed CI/CD systems based on ephemeral Docker containers

Advanced license handling options exist to adapt to all these situations

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Advanced Reporting Facilities

ECLAIR has advanced reporting facilities, highly configurable depending on the needed level of detail

Findings can be navigated interactively through any browser

Source code and preprocessed code are both shown

In addition, reports can be generated in many formats: pure text, HTML, XML, JSON, CSV, Word, Excel, LibreOffice Writer, LibreOffice Calc, …

Independence Checker

ECLAIR Independence Checker allows for the automatic checking of architectural constraints, which is instrumental in proving:

- freedom from interference (ISO 26262)
- independence (ISO 26262, DO-178C, IEC 61508, EN 50128, EN 50716, ISO 19014)
- segregation (EN 50657, IEC 62304)
- isolation (ISO/SAE 21434)

Requirements Management Tool

ECLAIR comes with an integrated requirements management tool

It allows you to keep track of your requirements, with traceability information all the way down to the code and test cases, with ECLAIR telling you about uncovered requirements and spurious code

Beautiful interactive documentation

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Tool Qualification

ECLAIR is certified by TÜV SÜD and qualifiable for the main functional-safety standards up to the highest criticality levels:

- ISO 26262 (automotive) up to ASIL D
- IEC 61508 (industrial) up to SIL 4
- EN 50128 (railway) up to SIL 4
- EN 50657 (railway, rolling stock applications) up to SIL 4
- IEC 62304 (medical) up to Class C
- ISO 25119 (agriculture and forestry) up to SRL 3
- ISO 19014 (earth-moving machinery) up to MPLr e

ECLAIR Functional Safety Ecosystem

ECLAIR FuSa Pack includes:

- TÜV SÜD Certificate
- TÜV SÜD Technical Report
- ECLAIR Safety and Security Manual
- Consulting

ECLAIR Qualification Kits contain all documents, test suites, procedures and automation facilities needed to qualify ECLAIR in compliance with functional safety standards, e.g., DO-178C/DO-330 and ISO 26262

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ECLAIR Functional Safety Ecosystem (cont'd)

ECLAIR Qualification Service

When the operational environment can be reproduced (e.g., by means of virtual machines or Docker containers), BUGSENG safety team can do the ECLAIR qualification work for you in 10 working days

Library Qualification

New add-on ECLAIR Code Scout allows for automatic characterization of the exact portions of C/C++ libraries exercised by C/C++ applications

In other words, the tool automatically tells you the exact portion of C/C++ libraries you are using, avoiding extra and unnecessary qualification work

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Compiler Qualification

BUGSENG and Solid Sands joined forces to make effortless, continuous compiler qualification possible

CerTran automatically produces one SuperTest configuration for each detected use case and uses the test and validation suite to qualify the compiler for all of them. This can be incorporated into a Continuous Integration system

CerTran helps you saving time, avoiding configuration errors, and getting the most out of your SuperTest/SuperGuard licenses