Luca Ciucci

Software developer focused on systems programming, static analysis and scientific software

About me

I work on software for technically demanding domains, combining experience in C/C++ tooling, static analysis, scientific computing, 3D reconstruction, and low-level systems development.

Interests

- Core interests
- Languages & tools
- Systems
- Technical domains
- Electronics
- Mechanics

Contact Info

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Main Interests

- **Core interests**: Scientific and technical foundations that shape how I approach engineering problems. Physics, Mathematics, Programming, Scientific computing, Software architecture
- **Languages & tools**: A broad toolkit, with current emphasis on systems, static analysis, and scientific software. Rust, C++ & C, Prolog, Python, TypeScript & JavaScript, Matlab, LaTeX & Typst, Build systems, Lua, Fortran, Java, HTML & CSS, LabVIEW, Pascal, PIC Basic
- **Systems**: Software close to the machine, from desktop applications to constrained devices. Desktop applications, Microcontrollers, Embedded systems, Inter-process communication, Developer tooling
- **Technical domains**: Applied numerical methods, geometry, and software engineering for real-world measurement systems. 3D reconstruction, Structured light scanning, Computer vision, Image processing, Camera calibration, Quaternions, Differentials, Numerical optimization, Neural networks, GUI development
- **Electronics**: Basic practical knowledge, mainly working with prebuilt boards, sensors, cameras, and embedded components.
- **Mechanics**: Practical experience with manual tools, CNC machines, `G-code`, `CAM`, and 3D printing.

Work Experience

Software Developer @ BUGSENG s.r.l. (2024-09-02 ~ present)

I contribute to ECLAIR, BUGSENG's static analysis platform for C and C++ software, used in contexts where correctness, maintainability, and compliance with safety-critical coding standards are important.

My work involves analysis-related development, developer tooling, automation, and integration tasks across a mixed technology stack. The main focus is on C/C++ static analysis and support for coding standards such as MISRA, AUTOSAR, and CERT, while also contributing to surrounding tools, scripts, interfaces, integrations, development workflows and web components.

Research and Development @ Scanny3D s.r.l.

Worked on software and algorithms for 3D scanning & reconstruction, combining programming with practical work on cameras, projectors, electronics, mechanics, calibration, and 3D printing.

The work involved both experimental prototyping and practical engineering, from acquisition workflows and reconstruction algorithms to hardware integration.

Publications & Contributions

[1] Roberto Bagnara, Ayoub Bourjilat, Luca Ciucci, Roy Jamil, and Nicola Vetrini, *Zephyr: An Ideal Platform for Introducing the Software Development Processes of Safety-Critical Embedded Systems*. 2025. [Online]. Available: https://www.zephyr-sceduconf.org/zise2025

[2] Luca Ciucci and Serena Bruzzesi, "High-performance computing for quantum field theory: a case for Rust in Monte Carlo simulations." June 06, 2025. [Online]. Available: https://scientificcomputing.rs/2025/talks/ciucci.html

[3] Roberto Bagnara, Nicola Vetrini, Luca Ciucci, Abramo Bagnara, and Federico Serafini, *C, Rust, C-rusted and MISRA for Safe and Secure Embedded Software*. WEKA

FACHMEDIEN GmbH, 2025. [Online]. Available: https://hdl.handle.net/11381/3034341

[4] The MISRA Consortium, "MISRA C:2025 Addendum 6 - Review contributors (acknowledgement)," Mar. 2025. [Online]. Available: https://misra.org.uk/app/uploads/2025/03/MISRA-C-2025-ADD6.pdf

[5] P. Francavilla *et al.*, "A low-cost Cherenkov detector to be tested in CERN's T9 beam line," Mar. 20, 2018. [Online]. Available: https://doi.org/10.22323/1.314.0822

Education

2018 - present

University of Pisa
Physics studies at the University of Pisa, with current focus on theoretical physics, quantum field theory, lattice field theory, numerical methods, and scientific computing.

17/7/2017 - 21/7/2017

Ducati "Fisica in moto" summer school
Attended lessons on mechanics, physics laboratory, motorbike mechanical development, production, data analysis, and cooperative problem solving.

26/6/2017 - 1/7/2017

"Modern Physics for students" summer school
Attended physics courses with emphasis on classical and modern physics, including laboratory experiences in measurement and computing.

March 2017

IPPOG International Masterclass 2017
Attended courses on high-energy particle accelerator physics at the LNF INFN laboratories, with particular interest in accelerator technologies and tracking detectors.

4/6/2018

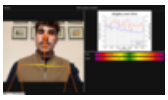
Cambridge English First Certificate
English level B2.

2013 - 2018

Scientific high school diploma
Scientific high school diploma, applied sciences section, with a 100/100 score at T.C.O. Fermo.

Educational projects

6/6/2023



"Learning by doing" competition winners
Built Body Tracking Web and the *VDU posture monitor*, a prototype system designed to help people improve their posture while working at a video terminal.
The project won the competition organized by Confindustria Marche and continued toward product-oriented development.

17/12/2019

"ASML Intergalactic Coding Challenge" winner
Winner of the ASML Intergalactic Coding Challenge 2019.

20/9/2017 - 2/10/2017

Beamline for Schools winners, CERN test beam experience
Two-week experience at CERN after winning the Beamline for Schools competition. We performed tests on the T9 beam facility with a Cherenkov detector proposed and built by our school team.
I was particularly involved in detector design, construction and testing, data analysis, and electronics.

- Project website
- Beamline for Schools 2017 edition
- INFN article

22/9/2016

LNF INFN beam test experience

Performed experiments with the Cherenkov detector from the 2016 BL4S proposal on one of the Frascati INFN LINAC's beams at the BTF.

2017

"Olimpiadi della robotica"

Participated with the "pac-man" project, for which I built most of the robot and all the firmware.

2016

First BL4S proposal

Participated in the first group of the school project proposing a Cherenkov-effect detector for the 2016 CERN Beamline for Schools competition.