### Pablo Balmaceda Rescia

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SUMMARY



# Dedicated Aerospace Software Developer with a strong academic background in Physics and Mathematics. Proficient in C#, C/C++, and FORTRAN, specializing in innovative solutions for the aerospace industry. Adept at translating complex technical concepts into practical applications. Seeking opportunities to leverage skills and knowledge in software development and research to contribute to cutting-edge projects.

# EDUCATION



## **Universidad de Costa Rica (UCR)** St Pedro, CR

*Bachelor of Science in Physics* Mar 2012 - Sep 2017

*Bachelor of Science in Mathematics* Mar 2015 - Sep 2017

## **Università di Pisa (UNIPI)** Pisa, IT

*Master of Science in Mathematics* Sep 2018–unfinished

*Master of Science in Physics*  Sep 2019 – Feb 2020 and Sep 2023 - present

# PROFESSIONAL EXPERIENCE



**Aerospace Software Developer**. Sep 2023 – present

[*LEONARDO IT*](https://www.leonardo.com/en/home)| [TXT esolutions](https://pace.txtgroup.com/products/extended-reality/pacelab-weavr/?hsLang=en) Milan Lombardy, **Italy**

* Contributed to bug fixing and enhancements for SkyFlight Mission Planning, a modular, multi-platform, and multi-user ground-based system. Facilitated mission planning, briefing, and analysis in Military and Civil Operations, ensuring seamless aircraft data transfer to on-board systems.
* Specialized in back-end development C++ / QT, ensuring the reliability and efficiency of the modular system.

**Aerospace Software Developer**. Sep 2022 – Sep 2023

[*LEONARDO UK*](https://www.leonardo.com/en/home)| [TXT esolutions](https://pace.txtgroup.com/products/extended-reality/pacelab-weavr/?hsLang=en) Yeovil Somerset, **United Kingdom**

* Development a server/client video streaming solution in C# to share the panels of the cockpit, obtaining a high resolution image quality.
* Implementation of Virtual Reality (VR) controllers for helicopter’s cockpit with Unity, and stablish connection between the graphical part and the simulation.

**Aerospace Software Developer**. Feb 2022 – Aug 2022

[*LEONARDO IT*](https://www.leonardo.com/en/home)| [TXT esolutions](https://pace.txtgroup.com/products/extended-reality/pacelab-weavr/?hsLang=en) Milan Lombardy, **Italy**

* Development a tool/plugin in C# that allow to traduct automatically and analyze old pilot procedures simulation into [Unity/WEAVR](https://unity.com/products/weavr) virtual reality development environment, generating procedures in VR more quicker, reaching a 95% of procedure's translation, allowing then a faster integration.

**Physics Research.** Sep 2019 –Jan2020

*Physics Department* | UNIPI Pisa Tuscany, **Italy**

* Investigation of the topological invariants in Quantum Field Theory, with special interest in knot theory, looking for applications on topological quantum computing technology, a market that will grow at a CAGR of 56.0% for the next 10 years.

## **Research Assistant.** Jul 2015 – Nov 2016

*Materials Science and Engineering Research Center (CICIMA Spanish acronym)* | UCR | [CICIMA-UCR](http://www.cicima.ucr.ac.cr/index.php/en/) San Pedro, **Costa Rica**

* Performed adjustments for the thin films spectrometer that allowed more precise measurements, in a teamwork with two researchers, improved it in that way the wavelength range and thickness range, using a Deuterium and Tungsten-Halogen light source, by up to 25% more.
* Implemented on C the Levenberg-Marquart algorithm ([GitHub-LMA](https://github.com/Pablichenco/Levenberg-Marquardt)) for non-linear optimization problems, achieved a better curve fitting for refractive index, applied a reduced error criterion, was obtained that the fit error is of the same order as the measurement error as desired χ2 ≅ 1,obtaining a robust method applicable to many other cases of optimization.

**Mathematics Assistant**. Mar 2014 – Nov 2015

*Mathematics Department* | UCR San Pedro, **Costa Rica**

* Supported to freshman students, outside of regular lessons with examples, problems, clarify doubts and score quick tests, with an increase in the success fee near of 9% compared to previous years. Acquired the capacity of communicating mathematical concepts to people without experience in mathematics.

# VOLUNTEER EXPERIENCE



**Volunteer Teacher** | *logic-math teacher for deaf high school students* Sep 2016 – Sep 2017

* Endorsed deaf students in the final year of high school in logic and mathematics, 4 of the 6 students achieve better university admission grades, and all improved their final high school exams.
* Developed a strong interpersonal skill and the ability to collaborate effectively on a interdisciplinary team of 5 professionals.

# RESEARCH



**Undergraduate final year Research Project**| *Dielectric function of Zr in terms of hydrogen* Sep 2016 – Sep 2017

* Created a zirconium and palladium multi-layer thin film in terms of concentration of hydrogen, to study optical properties, obtaining a reflectance of near the 80% in the infrared spectrum.
* Implemented the LAPACK library on the Levenberg-Marquart algorithm, using a parametric approach, in order to obtain a numerical model more robust, with a successful comparation of the experimental measurements with an error estimated of the order of 10-3 (plots: [plot.ly](https://chart-studio.plotly.com/~pablichenco#/)).

**Quantum Mechanics review paper** | [*Density Operator*](https://www.academia.edu/31593881/Density_matrix_notes) UCR, Physics

* Explored the basics applications in quantum computing (Bloch sphere), expectation values, statistical physics and presented the 3 modified axioms for quantum mechanics, all in a didactical way.

# SKILLS & TECHNICAL SKILLS



**Programming Languages**: C/C++, C#, FORTRAN, Wolfram Mathematica, LaTeX, Bash, basic level of: QT, *Python, FullStack Dev course:[ Java, PL/SQL, HTML, CSS, JavaScript, Angular]*.

**Languages**: Spanish, Italian (Upper Intermediate), English (Upper Intermediate), German (starting to learn).

**Developer Tools**: Visual Studio, Xcode, Atom, Eclipse, RStudio, Texpad, TexMaker, Mathematica.

**Libraries**: LAPACK, gnuplot, git, plotly API, .

**Interest**: Numerical Methods, Data analysis, Quantum Computing, knot theory, TQFT, [digital-art](https://www.behance.net/pabalres), hiking, climbing.

# PERSONAL PROJECTS



[**Particle on a Magnetic field**](https://github.com/Pablichenco/ParticleMagnetic): Develop a numerical model using Runge-Kutta 4, to solve a LDE. (C, [plot.ly](https://chart-studio.plotly.com/~pablichenco/123/#/))

[**Wave equation**](https://github.com/Pablichenco/Crank-Nicolson-Method-PDE): Performed a Crank-Nicolson finite diﬀerence method to solve a PDE. (FORTRAN)