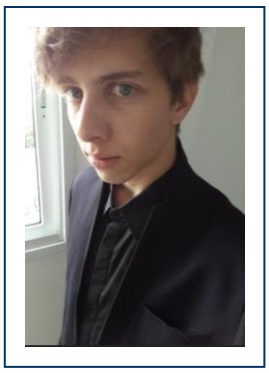
CARLOS EDUARDO AMÉRICO



Mechanical Engineer linkedin.com/in/cea

Single, Brazilian, 25 years old **Phone number:** +55 042 99845-0239

E-mail: ceamerico123@hotmail.com

Current address: St. José Bonifácio, 48 – Prudentópolis – PR – Brazil.

Availableness to move to other cities and countries.

Availableness to order professional certification registry (CREA).

EDUCATION

- Master's degree - Mechanical Engineering - Federal University of Paraná (02/2019 - 08/2021). Research Line: **CFD, Aerodynamics and Rocket Propulsion**. Member of Carl Sagan rocketry group and CFD research group. Also, I was programming language assistant teacher in 2019. My dissertation is related to turbulence modeling for CFD on compressible turbulent flow inside a rocket nozzle.
- Mechanical Engineer - Positivo University (02/2014 - 11/2018). Co-founder of the Aerodynamics of self-propelled vehicles study group and co-founder of Brazilian Association of Rocketry. Also, I was a calculus assistant teacher and made three undergraduate types of research on fluid mechanics, aerodynamics, and materials engineering fields.

WORK EXPERIENCE

- 03/2017 – 12/2018 – Brazilian National Steel Company – CSN-PR – Maintenance Engineering Department.

  Position: Intern. Worked at maintenance engineering department and predictive department. Developed projects and activities ensuring reliability and availability for almost 250 equipment's using predictive techniques such as lubricant oil analysis, thermography analysis, and vibration analysis. Also Responsible for planning and execute oil analysis program, contract and finances management (via SAP and SIGMA software's), contact with providers and laboratories, create and arrange service orders for preventive maintenance.

  Responsible for data analysis, create tendencies and KPI's for maintenance strategy from company previous data versus new results. Promoted, arranged and executed projects objectifying avoid particle and water in oil contamination, cross-contamination, stabilize or grow equipment's life such as pumps, gearboxes, hydraulic units, generators, compressors, proportional and directional Moog valves. Also provided systems for oil monitoring condition via PLC using water in oil sensors and filtration media saturation, developed several filtration systems for individual equipment's units with unique features.

  Made structural, hydraulic and thermal sizing. Realized heat exchange, and oven thermal efficiency analysis, resulting in a proposal for thermal upgrade and oven balance. If those changes have been implemented, it would increase production and cause an abrupt reduction in natural gas consumption.

LANGUAGES

- **Portuguese** – Native Language
- **English** – CEFR: **C1**. IELTS TRF: 21BR001035AMTC111A
- **Russian** – Intermediate

COMPLEMENTARY FORMATIONS

- 02/2020 – 02/2021 – Aerodynamic course applied to aeronautical engineering: fundamentals of aerodynamics, wing and fuselage theory, wind tunnels and their experimental and mathematical approach, drag theory, and high accuracy computational models designed for flight simulation.
- 11/2020 – Turbulent flows Minicourse: physical, mathematical, and computational modeling of turbulent flows.

SIDE PROJECTS AND PARTICIPATIONS

- 01/2021 – 06/2021 – Collaboration between my Master's degree at UFPR and the Brazilian Institute of Aeronautics and Space: realized computational simulations for the gas flow inside a rocket nozzle, obtaining temperature, pressure, velocities, dynamic and turbulent viscosity profiles. Applying inviscid and viscous computational methods with additional equations to deal with turbulent flow and its closure problem (RANS models in CFD++ code).
- 02/2019 – 12/2019 – Teacher's Assistant of Fortran programming language: responsible for Fortran programming language tutoring including: basic commands (variables and expressions, function allocation, execution control, formats, inputs, and outputs); advanced commands (modules, logical relation between programs and dialog boxes), and code optimization (memory consumption analysis, running time, documentation and programming techniques).
- 02/2019 – Current - CFD Research Group: member of the CFD group (*Computational Fluid Dynamics*), Propulsion and Aerodynamics of Rockets from the Federal University of Paraná. This group improves and applies computational techniques in CFD (method of characteristics, multigrid methods, finite volume methods, and finite difference methods), develops its computational codes and computational models using Fortran 2008 and Python as programming languages. Also, I'm one of the members responsible for structural, thermal, and aerodynamic sizing of experimental rockets (including but not limited to nozzles, nose cone, fins, and diameter transitions), mechanical drawing design, parachute sizing, flying trajectory, rocket motor static tests, data and performance analysis before and after a flight, solid propellant mixing and manufacturing.
- 03/2016 – 12/2016 - Teacher's Assistant of Differential and Integral Calculus: responsible for exercises solutions and tutoring sessions, addressing topics like multiple integrals in polar, spherical, and rectangular coordinates; partial derivatives; ordinary and partial differential equations; vector calculus; infinite sequences and series; line and surface integrals.

PAPERS

- 2022 – Title: An application of the Method of Manufactured Solutions into a Spalart-Allmaras equation code. Paper submitted for the 3rd Brazilian Congress of Computational Fluid Dynamics – CBCFD.

- 2022 – Title: Computational Predictions of the Two-Dimensional Compressible Turbulent Flow Through a Rocket Nozzle. Paper under preparation for the AIAA Journal.
- 2022 – Title: Coordinates Exchange and Discretization Processes of the Spalart-Allmaras Equation for Finite Volume Codes. Paper under preparation for the AIAA Journal.
- 2020 – Title: Development of a ballistic evaluation motor for KNSU burn rate measurements. Paper published in the 18th Brazilian Congress of Thermal Sciences and Engineering – ENCIT.
- 2020 – Title: Motor foguete experimental com aerospike tipo PLUG. Paper published in the 20th International Congress of Mechanical and Industrial Engineering - CONEMI. Unofficial title translation: “Experimental Rocket with Toroidal Aerospike Nozzle”.