

Rodrigo VICENTE CRUZ

PhD in Fluid Mechanics

CMCC Foundation

@ rodrigo.vicente@cmcc.it

in [Rodrigo Vicente Cruz](#)

Languages

- English : C1 (TOEIC 990/990)
- Italian : B2
- French : C1
- Portuguese : Native

Soft Skills

- Written/spoken communication
- Writing of scientific articles, technical reports and technical documentation
- Lecture/seminar preparation and planning

Hard Skills

- Fortran
- C
- Python
- Matlab
- Parallel programming (MPI)
- HPC architectures
- Xcompact3d
- Star-CCM+
- OpenFOAM
- Comsol
- Fluent
- Paraview
- Catia
- SolidWorks
- BASH
- UNIX / LINUX
- GIT

Career Summary

2022 – current	Post-Doctoral Researcher	CNRS, EDF R&D - France
	<ul style="list-style-type: none">• Numerical investigation of turbulent heat transfer under mixed convection regime in nuclear reactors.• Development and validation of numerical tools for the accurate simulation of the physics of turbulence and heat transfer and for the subsequent data processing.• Technical advisor in meetings with industrial partners.	
2021 – 2022	Research and Teaching Assistant	PPRIME Institute - France
	<ul style="list-style-type: none">• Improvement and validation of a numerical code for the simulation of conjugate heat transfer in complex geometry confined flows.• Lecture, Practical and Tutorial Courses of Applied Physics (<i>Metrology and Heat Transfer; Sensors and Electromagnetism; Wave Propagation</i>).	
2018 – 2021	PhD Researcher	University of Poitiers - France
	<ul style="list-style-type: none">• Development and validation of a CFD tool for the accurate simulation of turbulence and heat transfer in complex geometry flows.• Practical and Tutorial Courses in Fluid Mechanics 2.	
2017	Internship M2 - Aerodynamics/Aeroacoustics	PSA Group - France
	<ul style="list-style-type: none">• Development of CFD tools for the Aerodynamic/aeroacoustic investigation of the whistling phenomenon in the flow around side-mirrors.	
2016-2017	Internship M1 - Aerodynamic Optimisation	PSA Group - France
	<ul style="list-style-type: none">• Experimental (wind tunnel tests) and CFD investigations.• Aerodynamic optimisation of the rear shape of vehicles for drag reduction and improved control of lateral stability.	
2016-2017	Design Office - Aerodynamicist	Tucano Aerodesign Team - Brazil
	<ul style="list-style-type: none">• Design, optimisation and manufacture of a RC cargo aircraft for the SAE Brazil AeroDesign Competition.• Leader of the aerodynamic division. Responsible of numerical simulations and wind tunnel tests for aerodynamic optimisation; 3D design of the aircraft and its components (CAD); writing of the aerodynamic technical report.	
2015-2016	Internship BSc - Experimental Fluid Dynamics	MFLAB - Brazil
	<ul style="list-style-type: none">• Wind tunnel investigation of the behaviour of a wing subjected to the wake of a cylinder in transient flow.	

Education

2018 – 2021	PhD in Fluid Mechanics	Univ. of Poitiers, France
	R. Vicente Cruz, “High-fidelity simulation of conjugate heat transfer between a turbulent flow and a duct geometry”, PhD Thesis, University of Poitiers, 2021. Available Online .	
2016 – 2017	MSc in Aeronautical and Ground Transport	ISAE-ENSMA, France
	<i>Major : Aerodynamics</i> Aerodynamics, combustion, thermal modelling, numerical methods, aeroacoustics, turbomachinery and vortex dynamics.	
2011 – 2017	BSc in Aeronautical Engineering	Federal Univ. of Uberlandia, Brazil
	Five years (format of the Brazilian bachelor’s degree) of practical and theoretical training in aerodynamics, structural mechanics, thermal engineering, electronics, stability and flight controls.	

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Publications

1. R. Vicente Cruz, C. Flageul, E. Lamballais, V. Duffal, E. Le Coupanec and S. Benhamadouche, 'High-Fidelity Simulation of Turbulent Mixed Convection in Pipe Flow.' International Journal of Heat and Fluid Flow, Nov. 2024.
doi:[10.1016/j.ijheatfluidflow.2024.109640](https://doi.org/10.1016/j.ijheatfluidflow.2024.109640)
2. R. Vicente Cruz and E. Lamballais, 'Physical/numerical duality of explicit/ implicit subgrid-scale modelling', Journal of Turbulence, pp. 1–45, May 2023,
doi:[10.1080/14685248.2023.2215530](https://doi.org/10.1080/14685248.2023.2215530).
3. R. Vicente Cruz and E. Lamballais, 'A versatile immersed boundary method for high-fidelity simulation of Conjugate Heat Transfer', Journal of Computational Physics, vol. 488, p. 112182, Sep. 2023, doi:[10.1016/j.jcp.2023.112182](https://doi.org/10.1016/j.jcp.2023.112182).
4. E. Lamballais, R. Vicente Cruz, and R. Perrin, 'Viscous and hyperviscous filtering for direct and large-eddy simulation', Journal of Computational Physics, vol. 431, p. 110115, Apr. 2021, doi:[10.1016/j.jcp.2021.110115](https://doi.org/10.1016/j.jcp.2021.110115).

International Communications

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|----------------------------------|---|
| Rome, 2023
<i>Italy</i> | High-Fidelity Simulation of Turbulent Mixed Convection in Pipe Flow
<i>R. Vicente Cruz, C. Flageul, E. Lamballais, V. Duffal, E. Le Coupanec and S. Benhamadouche</i>
10th International Symposium on Turbulence, Heat and Mass Transfer (THMT'23). doi: 10.1615/ICHMT.THMT-23.750 |
| Rhodes, 2023
<i>Greece</i> | Towards high-fidelity simulation of wall turbulence subjected to conjugate heat transfer in complex geometry.
<i>R. Vicente Cruz, E. Lamballais, and R. Perrin</i>
13th International ERCOFTAC symposium on engineering, turbulence, modelling and measurements (ETMM13). Available Online . |
| Paris, 2020
<i>France</i> | High-fidelity simulation of heat transfer in turbulent pipe flow
<i>R. Vicente Cruz, E. Lamballais, and G. F. N. Campo</i>
Advances in Thermal Hydraulics (ATH 2020). Available Online . |
| Madrid, 2019
<i>Spain</i> | Implicit Wall-Layer Modelling in Turbulent Pipe Flow
<i>R. Vicente Cruz, E. Lamballais, and R. Perrin</i>
Direct and Large Eddy Simulation XII (DLES 12).
doi: 10.1007/978-3-030-42822-8_56 . |
| Trondheim, 2019
<i>Norway</i> | From Explicit to Implicit Subgrid-Scale and Wall Modelling in Large-Eddy Simulation
<i>E. Lamballais & R. Vicente Cruz</i>
10th National Conference on Computational Mechanics (MekIT'19).
Available Online . |
| Le Havre, 2018
<i>France</i> | Etude numérique d'un phénomène de sifflement de rétroviseur
<i>F. Margnat, R. Vicente Cruz, W. Gonçalves Da Silva Pinto, H. Lazure</i>
Congrès Français d'Acoustique (CFA 2018) |

Expertise

Peer Reviewer

1. Journal: Computers & Fluids. ISSN: 0045-7930. Year : 2023.
2. Journal: Int. Journal of Heat and Mass Transfer. ISSN: 0017-9310. Year : 2024.