

Juan Andrés Santisteban Hidalgo

Brazilian, married, 34 years old

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EDUCATION

- 2017 – 2024 **D.Sc. - Mechanical Engineering**
PUC-Rio (CAPES 7)
Title: *Analytical Modeling of an Acoustic-Electric Transmission Channel in Cylindrical Coordinates with a Transversely Polarized Transducer.*
- 2014 – 2016 **M.Sc. - Mechanical Engineering**
Universidade Federal Fluminense (CAPES 5)
Title: *Frequências Naturais de Vibração de Tubos Horizontais Parcialmente Cheios de Líquido.*
- 2008 – 2013 **B.S. - Mechanical Engineering**
Universidade Federal Fluminense
Title: *Análise Numérica e Experimental de Vibração em Tubos Parcialmente Cheios de Líquido.*

WORK EXPERIENCE

- 2022 – 2024 **Mechanical Engineering Specialist**
Ouronova, Rio de Janeiro
- Specialist Engineer in the P&A Assistant (Plug and Abandonment Assistant) project, in partnership with REPSOL. The objective of this work was to develop software capable of providing the interpretation of acoustic logging data from oil wells in the abandonment phase using artificial intelligence. In this project, I developed simulation models from the inspection of the analyzed wells, providing synthetic data for the understanding of the phenomena visible in the processed data. In addition, to implement the simulation models in the software, I used open-source tools to build the same numerical models, reducing license costs.
- 2019 – 2022 **Mechanical Engineer**
LSFO-PUC Rio, Rio de Janeiro
- Researcher of the TTILT (Through-Tubing Intelligent Logging Tool) project, in partnership with REPSOL Sinopec. This work aims to develop a new technology for acoustic logging of oil wells in the abandonment phase. In this work, I performed simulations of the well inspection process, using ultrasonic transducers, considering different defect scenarios. With this, a database was obtained to assist in the choice of the most appropriate machine-learning techniques to achieve the main objectives of the project. In addition, the simulation results were compared with experimental results, verifying the robustness of the developed models.
- 2014 – 2016 **Researcher**
Universidade Federal Fluminense, Niterói
- Member of the research project of the Fluminense Federal University joint with the Brazilian Navy on technical modifications of underwater monitoring devices. In this work, I performed computational numerical simulations of the hydrodynamics of submerged structures to assist in the main objectives of the project.

2012 – 2013 **Internship**

KFC Projetos e Consultoria, Rio de Janeiro

- Experience with: Hydraulic study of pipelines in fuel storage bases; Study and analysis of fire-fighting systems according to current standards; Thermal calculation and mechanical calculation in heat exchangers and pressure vessels; Preparation of technical reports; Selection of hydraulic pumps; Analysis and modeling of structures in finite element softwares.

PUBLICATIONS

2024 **Offshore Technology Conference**

Title: *AI-Based Cement Bond Quality Assessment: A First Step for Optimizing P&A Design*

Authors: T. M. Correia, I. G. Camerini, J. A. Santisteban Hidalgo, G. R. B. Ferreira, L. P. B. de Souza, A. S. Rodrigues, J. Penatti, A. M. B. Braga, R. V. de Almeida

Doi: <https://doi.org/10.4043/35108-MS>

2024 **SPE/IADC Drilling Conference and Exhibition**

Title: *Supervised Machine Learning Applied to Cement Integrity Assessment – A Comparison Between Models and Feature Extraction Techniques*

Authors: G. R. B. Ferreira, I. G. Camerini, A. S. Rodrigues, T. M. Correia, L. P. B. de Souza, J. A. Santisteban Hidalgo, J. Penatti, L. N. A. C. Soares

Doi: <https://doi.org/10.2118/217962-MS>

2024 **Geoenergy Science and Engineering (Journal)**

Title: *HOG-CNN based evaluation of cement integrity using 2D dispersion curves from an experimental through tubing logging setup*

Authors: T. M. Correia, L. P. B. de Souza, G. R. B. Ferreira, I. G. Camerini, J. A. Santisteban Hidalgo, A. S. Rodrigues, A. M. B. Braga, H. V. H. Ayala, A. C. Kubrusly, L. N. A. C. Soares

Doi: <https://doi.org/10.1016/j.geoen.2024.212854>

2023 **Abu Dhabi International Petroleum Exhibition and Conference**

Title: *Machine Learning Assisted Cement Integrity Evaluation During Plugging and Abandonment Operations*

Authors: I. G. Camerini, G. R. B. Ferreira, L. P. B. de Souza, J. A. Santisteban Hidalgo, T. M. Correia, A. S. Rodrigues, J. H. G. Batista

Doi: <https://doi.org/10.2118/216950-MS>

2023 **Geoenergy Science and Engineering (Journal)**

Title: *Machine learning-based cement integrity evaluation with a through-tubing logging experimental setup*

Authors: L. P. B. de Souza, G. R. B. Ferreira, I. G. Camerini, T. M. Correia, M. G. C. Ribeiro, J. A. Santisteban Hidalgo, B. L. D. de São João, R. W. A. Llerena, A. C. Kubrusly, H. V. H. Ayala, A. M. B. Braga, J. H. G. Batista

Doi: <https://doi.org/10.1016/j.geoen.2023.211882>

2019 **Rio Oil & Gas Expo and Conference**

Title: *Analytical and numerical modeling of through-tubing acoustic logging*

Authors: T. M. Correia, L. P. B. de Souza, J. A. Santisteban Hidalgo, M. G. C. Ribeiro, I. G. Camerini, B. G. de Souza, A. C. Kubrusly, H. V. H. Ayala, J. H. G. Batista, R. V. de Almeida

Doi: <https://doi.org/10.48072/2525-7579.rog.2020.099>

2017 **Journal of Sound and Vibration**

Title: *Natural vibration frequencies of horizontal tubes partially filled with liquid*

Authors: J. A. Santisteban Hidalgo, A. L. Gama, R. M. Moreira

Doi: <https://doi.org/10.1016/j.jsv.2017.07.011>

2016 **ENCIT 2016 (Conference)**

Title: *Nonlinear wave sloshing in walled containers*

Authors: R. M. Moreira, V. A. M. Martins, J. A. Santisteban Hidalgo, J. T. A. Chacaltana, M. D. Patterson

Doi: 10.26678/ABCM.ENCIT2016.CIT2016-0348

PROJECTS

2022-2024

Plug and Abandonment Assistant (P&A Assistant)

Ouronova

Description: Project in partnership with Repsol to create software for interpreting the integrity of the cement layer in abandoned wells based on artificial intelligence models.

Roles: Construction of robust simulation models of the acoustic logging in oil wells using open-source libraries for implementation on a computational platform. Preparation of robust simulation models for complementing real data from acoustic logging tools.

2019-2022

Through Tubing Logging Tool (TTiLT)

PUC-Rio

Description: Project in partnership with Repsol Sinopec Brasil for creating a method to interpret the integrity of the cement layer in abandonment wells using "through-tubing" data, based on artificial intelligence models.

Roles: Construction of a database from robust simulation theoretical models of acoustic logging in oil wells to feed machine learning algorithms, exploring different techniques and methods.

2014-2015

Modificações técnicas dos Dispositivos Submarinos de Monitoramento Acústico (DSMA)

Universidade Federal Fluminense

Description: Applied research project joint with the Brazilian Navy on technical modifications (mechanical integration) of underwater acoustic monitoring devices (DSMA), with the purpose of evaluating their hydrodynamics in tubes of new SBR class submarines.

Roles: Construction of robust simulation models of the hydrodynamics of underwater devices to verify the viability of new mechanisms.

QUALIFICATIONS

Languages

English - Advanced
Spanish - Fluent
Portuguese - Fluent
Italian - Basic

Courses

Extension - PLAY - Programação Lúdica de Aplicações em Python - 2020
Extension - IA I - Inteligência Artificial - 2020
Intensive Training - COMSOL Multiphysics - 2019

Skills

Office Package - Word, Excel, Powerpoint
Python
Linux
Matlab
Visual Studio Code
Autocad
Solidworks
COMSOL Multiphysics
ANSYS
GMSH
Paraview
OpenCFS
HPC and parallel programming techniques for simulations
PZFlex
CFX
HTRI Software
CODEWARE Compress
Latex
Inkscape
Basics of JAVA and XML