

# Juan Andrés Santisteban Hidalgo

Brazilian, married, 34 years old

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## EDUCATION

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- 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

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- 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**

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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

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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

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### **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  
PZFlex  
CFX  
HTRI Software  
CODEWARE Compress  
Latex  
Inkscape  
Basics of JAVA and XML