Juan Andrés Santisteban Hidalgo

Brazilian, married, 34 years old

Niterói - RJ - Brasil

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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 Liquido.*

WORK EXPERIENCE

2025 – present **PUC-Rio, Rio de Janeiro**
Postdoctoral Researcher

- Postdoctoral researcher in the Mechanical Engineering department, working in collaboration with the Centre for Telecommunication Studies. I work with the design and development of simulation models of innovative electromagnetic acoustic transducers (EMATs). In this project, the acoustoelastic effect is also taken into account. This research contributes significantly to advancements in the field of non-destructive evaluation.

2022 – 2024 **Ouronova, Rio de Janeiro**
Mechanical Engineering Specialist

- 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 **PUC-Rio, Rio de Janeiro**
Mechanical Engineer Researcher

- Researcher of the TTILT (Through-Tubing Intelligent Logging Tool) project, in partnership with REPSOL Sinopec at the Optical Fiber Sensors Lab (LSFO). 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 **Universidade Federal Fluminense, Niterói**

Researcher

- 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 **KFC Projetos e Consultoria, Rio de Janeiro**

Internship

- 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

2025 **Journal of Vibration and Control**

Title: *Analytical modeling of a transversely polarized piezoelectric transducer using ABCD transmission parameters*
Authors: J. A. Santisteban Hidalgo, D. P. Prada, A. C. Kubrusly, A. M. B. Braga
Doi: https://doi.org/10.1177/10775463251351391

2025 **Wave Motion**

Title: *Acoustic wave propagation in oil wells: A comparison between semi-analytical and finite element modeling approaches*
Authors: L. P. B. de Souza, J. A. Santisteban Hidalgo, T. M. Correia, I. G. Camerini, G. R. B. Ferreira, A. S. Rodrigues, A. C. Kubrusly, A. M. B. Braga
Doi: https://doi.org/10.1016/j.wavemoti.2024.103487

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
C language
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