# Claudio Canales D.

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## Presentation

Master in Engineering Sciences, specialized in Mechanical Engineering. Researcher in biomechanics and biomaterials focused on experimental and numerical work, employing numerical methods, solid and fluid mechanics, finite element method, and continuum mechanics. Also, I have a profound interest in **machine learning** and optimization problems. I am a proactive, empathetic and responsible person with great learning capacity and used to work under pressure. I really enjoy working in a multidisciplinary team and continue learning more. Currently, programming finite element modules in the code of the laboratory and implementing reduced order model techniques for faster simulations

## Education

**University of Santiago of Chile** — Santiago, CL
*Master of Science in Engineering, Mechanical Engineering* — *Aug. 2018 – Dec 2020*

- **Scholarship awarded by USACH**
- GPA: 4.0 out of 4.0.
- Dissertation: *Characterization of Hyperelastic Materials with Metaheuristic Optimization Algorithms* **(7/7)**

**University of Santiago of Chile** — Santiago, CL
*Mechanical Engineering* ***(6 year program)*** — *March. 2016 – Dec 2020*

- **Maximum Distinction**

**University of Santiago of Chile** — Santiago, CL
*Mining Engineering → Change of career to Mechanical Engineering* — *March. 2012 – September 2015*

## Research Experience

**Research Assistant** — October 2019 – Present
*Biomaterials - Biomechanics Lab - University of Santiago of Chile*

- **CBIO 2020 Virtual Conference** — October 2020
  *Chilean Congress of Biomechanics and Biomaterials*
  *Evolutionary Strategies to Characterize Arteries and Stability of Transverse Isotropy*
- **Computational Mechanics Congress** — October 2019
  *"XVIII Jornadas de Mecánica Computacional 2019"*
  *Characterization of Hyperelastic Models Using Inverse Methods, Based on Metaheuristic Optimization*
- **XLII Ibero-Latin-American Congress on Computational Methods in Engineering and 3rd Pan American Congress on Computational Mechanics** — Nov 2021
  *Machine Learning for Biological Modelling and Simulation*
  *Evolutionary Strategies and Deep Learning to Characterize Soft Tissue*

**Evolutionary Algorithms Research Internship** — January 2020 – February 2020
*Université de technologie de Troyes (Light, nanomaterials & nanotechnologies L2N)*

- **International Conference on Metamaterials Photonic Crystals and Plasmonics** — 2021
  *University of Warsaw - Poland*
  *Symbolic regression in nano-optics: characterization of dispersive materials as a case study*

## Professional Experience

**Teacher of *Computational Mechanics*** — March 2021 – Present
*Undergraduate Course at University of Santiago of Chile*

**Teacher of *Computational Mechanics Design*** — March 2021 – Present
*Undergraduate Course at University of Santiago of Chile*

**Teacher of *Complements of Algebra*** — October 2020 – March 2021
*Undergraduate Course at University of Santiago of Chile*

**Teacher Assistant of Computational Mechanics** — March 2018 – July 2020
*Undergraduate Course at University of Santiago of Chile*

**Teacher Assistant of Computerized Design** March 2018 – July 2020
*Undergraduate Course at University of Santiago of Chile*
**Lions Up Chile Finalist (entrepreneurship contest).** September 2016

## Programming and Software Skills

**Programming Languages**: Fortran, Python, C/C++, Matlab/Octave, HTML .
**Software**: Latex, Git, Ansys, OpenFOAM, Solidworks, Inventor, Autocad, Fusion 360, SAM,Arduino,Paraview,GiD, Matlab, Office, EDEM, Ubuntu.

## Computational Mechanics Experience

**Finite Element Method**
**Topology Optimization**
**Machine Learning**: Deep Learning Specialization Coursera, ROM, Tensorflow
**Hyperelastic Modelling**: Isotropic and Anisotropic.
**Fluid Simulation**: Laminar, Tubulent, Non-newtonian.
**Metaheuristic Optimization**: Genetic Algorithm, Genetic Programming, PSO, Evolutionary Strategies, MOGP.

## About Me

- Full name: Claudio Héctor Canales Donoso
- Chilean ID:18.720.109-8 | Passport: F11725216
- Address: Puerta del sol 180, Las Condes, Santiago, Chile.
- Birth: 11th of April of 1994 | Age: 27 years old
- Languages : Native Spanish | Advanced English

## Publications

[1] Rivera, E., **Canales, C.**, Pacheco, M. et al. Biomechanical characterization of the passive response of the thoracic aorta in chronic hypoxic newborn lambs using an evolutionary strategy. Sci Rep 11, 13875 (2021). https://doi.org/10.1038/s41598-021-93267-9. PDF
[2] **(Manuscripts in Progress) C. Canales**, C. García. D. Macías and D. Celentano. Evolutionary strategies to characterize isotropic hyperelastic materials.
[3] **(Manuscripts in Progress) C. Canales**, E. Rivera, C. García. D. Macías and D. Celentano. Evolutionary strategies to characterize hyperelastic anisotropic materials and a stabilization criterion for transversal isotropy.

## Academic References

**1.- Prof. Claudio García.**
- Head of the Department of Mechanical Engineering.
- University of Santiago of Chile.
- Email: claudio.garcia@usach.cl
- Researchgate Link

**2.- Prof. Diego Celentano.**
- Associate Professor.
- Catholic University of Chile
- Email: dcelentano@ing.puc.cl
- Researchgate Link

**3.- Prof. Demetrio Macias.**
- Professor (Assistant).
- Université de Technologie de Troyes.
- Email: demetrio.macias_guzman@utt.fr
- Researchgate Link