

# Natalia MÜHL CASTOLDI

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english, french, portuguese, italian

## Education

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Ecole d'Ingénieur SIGMA Clermont,  
France (2017-2019)

**Engineer Degree (Master) in Mechanical Engineering**  
**Specialization: Structures and Material Mechanics**

Universidade Federal do Rio Grande do Sul,  
Brazil (2014-2020)

**Engineer Degree in Mechanical Engineering**

Colégio Notre Dame Aparecida, Brazil (2011-2013) **High School**

## Professional Experience

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- 11/2020-... *Queensland University of Technology – BSRG, Brisbane (Australia)*  
*University Paris-Est Créteil – MSME, Créteil (France)*  
**Joint PhD Program:** « Understanding spinal growth and remodeling under healthy and pathological conditions using a combined computational and experimental approach »  
Supervisors: V. Sansalone, P. Pivonka.
- 02/2020-11/2020 *Universidade Federal do Rio Grande do Sul - GMAp, Porto Alegre (Brazil)*  
**Research Intern:** Characterization of the mechanical response and fluid flow in tendons subjected to large strains: Development of experimental methodology for tissue characterization, adaptation of an anisotropic poro-hyperelastic model (Abaqus), development of a FEMU (Finite Element Method Updating) method (Matlab) for the identification of model parameters.
- 03/2019-09/2019 *MFP Michelin – Clermont-Ferrand (France)*  
**Engineering Intern :** Prediction of geometry variation during extrusion process according to the thermomechanical history of a green mix by a viscoelastic behavior law 1/  
Experimental characterization of different types of green mixes (tensile and relaxation tests at variable temperature and strain rate), development of a non-linear viscoelastic model (Matlab), identification of the parameters by optimization (Matlab); 2/ Extrusion tests under real industrial conditions, development of a numerical model of the extrusion process (Matlab) based on the law of behavior of the part 1/.
- 05/2018-09/2018 *Noesis Solutions - Leuven (Belgium)*  
**Assistant Engineer Intern:** Investigation of an advanced strategy for constrained optimization problems: development of a hybrid optimization method (global/local) and implementation in Python and C++. Implementation of a multi-objective EGO optimization method, validation against several benchmarks.
- 02/2015-08/2017 *Universidade Federal do Rio Grande do Sul - GMAp, Porto Alegre (Brazil)*  
**Research Intern:** Numerical-experimental study of the mechanical response of polymeric materials in finite deformations: experimental characterization by mechanical tensile tests and measurements of the displacement field by digital image correlation (DIC); contribution to the development of a viscoplastic mechanical model (Ansys) and the identification of its parameters by FEMU (Matlab).

- 07/2016-01/2017      Participation in the realization of an experimental methodology for uniaxial traction tests on medial patellofemoral ligaments. Tests used for the validation of a new surgical technique proposed in the framework of a doctorate in medicine.
- 04/2016-08/2016      Assistance in the design of a dental extraction device: experimental tests on the extraction screw - tooth system, analysis of the impact of the geometry and material of the screw.

## Teaching and Supervision

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- 11/2020-...      **Practical/Exercise Courses:** solid mechanics, structural mechanics, anelastic mechanical behavior, numerical analysis and methods, mechanics of solid systems (~120 h).  
**Supervision:** one Master internship and one Master Project.

## Awards and Distinctions

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- 2022      **Research Grant for Supporting Joint PhD Studies** from Université Paris-Est Sup
- 2021      **Collaboration Scholarship for Young Researchers** from the French International Society of Biomechanics
- 2021      **Fee Waiver Scholarship** from Queensland University of Technology
- 2019      **Nomination for the SIGMA Michelin Foundation Award** (2 students per SIGMA Clermont specialization, i.e. top 5% of the entire class)
- 2017-2019      **BRAFITEC scholarship** (BRASil France Ingénieurs TEChnologie) exchange program for the exceptional duration of two years (usual duration of six months)
- 2016      **Nomination for the "UFRGS Young Researcher" award**
- 2016      **Award of excellence** in the section "Simulation and material properties" at the XXVIII Scientific Initiation Fair (SIC) of UFRGS. For the work "Study of a numerical-experimental methodology for the characterization of thermoplastics subjected to finite deformation"
- 2015      **Award of excellence** in the section "Solid Mechanics" at the XXVII Scientific Initiation Fair (SIC) of UFRGS. For the work "Study of an optical methodology of digital images correlation for heterogeneous displacement fields "

## Associative and Volunteer Experience

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- 04/2019-...      **Volunteer in "Volunteer for stay" program at Auberge Bishop:** Opportunity to meet people from around the world, expand experiences, work adaptability and discover Quebec/Canada.
- 09/2014-07/2015      **Chassis Subsystem Manager UFRGS BAJA Team:** Supervision and organization of project development of the chassis subsystem modeling.
- 10/2011-04/2012      **Active member of group EngajaMEC:** group of mechanical engineering students which seeks improvement to the mechanical engineering building and for its students.

## Activities and Interests

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Travel: exchange student interested in discovering new cultures (stays in France, Canada, Belgium and Italy)  
 Certified skydiver and scuba diver  
 Violinist and ballet dancer for more than 10 years.