

José Luís Medeiros Thiesen, Ph.D. Candidate

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Education

- 2022 – 2026 ■ **Ph.D., Mechanical Engineering** at Federal University of Santa Catarina (UFSC), Brazil. Supervisor: Prof. DSc. Eduardo A. Fancello.
Thesis title: *Multiscale modeling in hydrated porous media: Second-order computational homogenization and micromechanics of aortic dissection*, Supervisor: Prof. DSc. Eduardo A. Fancello.
- 2023 – 2024 ■ **Visiting Ph.D. Student, Biomedical Engineering** at Institute of Biomechanics, TU Graz, Austria. Supervisor: Prof. DSc. Gerhard A. Holzapfel.
- 2019 – 2021 ■ **M.Sc. Mechanical Engineering** at Federal University of Santa Catarina (UFSC), Brazil. Thesis title: *Algorithms and solution strategies in poroviscoelasticity: a study applied to the modelling of soft biological tissues subjected to large deformations*, Supervisor: Prof. DSc. Eduardo A. Fancello.
- 2014 – 2019 ■ **B.Sc. Mechanical Engineering** at Santa Catarina State University (UDESC), Brazil. Thesis title: *Numerical modelling to determine the effective properties of smart composite materials considering imperfect contact*.

Research Publications

Journal Articles

- 1 J. L. M. Thiesen, M. F. Janczkowski, and E. A. Fancello, "Towards hierarchical micropolar composites: A computational homogenization model of heterogeneous cosserat media," *International Journal of Solids and Structures*, 2026, ISSN: 1879-2146.
- 2 O. T. Pinto, B. Klahr, J. L. M. Thiesen, T. A. Carniel, and E. A. Fancello, "The lower shear modulus of younger subjects can result in stronger achilles tendons - an in silico analysis.," *Journal of the Brazilian Society of Mechanical Sciences and Engineering*, 2025, ISSN: 1806-3691. [DOI](#): 10.21203/rs.3.rs-3940486/v1.
- 3 J. L. M. Thiesen, B. Klahr, T. A. Carniel, G. A. Holzapfel, P. J. Blanco, and E. A. Fancello, "Second-order computational homogenization for bridging poromechanical scales under large deformations," *Computer Methods in Applied Mechanics and Engineering*, 2025, ISSN: 1879-2138. [DOI](#): 10.1016/j.cma.2024.117481.
- 4 J. L. M. Thiesen, R. Prado, K. Koji, T. Callegati, P. d. T. Mendonça, C. R. Roesler, and E. A. Fancello, "Load transfer in tibial intramedullary nailing: Effects of fracture level, screw configuration and nail-canal clearance," *Journal of Orthopaedic Research*, 2025, ISSN: 0736-0266. [DOI](#): 10.1002/jor.70102.
- 5 J. L. M. Thiesen, B. Klahr, T. A. Carniel, P. J. Blanco, and E. A. Fancello, "A second-order multiscale model for finite-strain poromechanics based on the method of multiscale virtual power," *Journal of Elasticity*, 2024, ISSN: 1573-2681. [DOI](#): <https://doi.org/10.1007/s10659-024-10077-6>.
- 6 J. L. M. Thiesen, B. Klahr, T. A. Carniel, and E. A. Fancello, "Limitations of poromechanical first-order computational homogenization for the representation of micro-scale volume changes," *Journal of the Brazilian Society of Mechanical Sciences and Engineering*, 2024, ISSN: 1806-3691. [DOI](#): <https://doi.org/10.1007/s40430-024-05043-1>.
- 7 T. A. Carniel, J. P. Eckert, E. B. Atuatti, B. Klahr, J. L. M. Thiesen, J. Mentges, O. T. Pinto, L. G. Müller, and E. A. Fancello, "Is the fluid volume fraction equal to the water content in tendons? insights on biphasic modeling," *Journal of the Mechanical Behavior of Biomedical Materials*, vol. 140, p. 105703, 2023, ISSN: 1751-6161. [DOI](#): <https://doi.org/10.1016/j.jmbbm.2023.105703>.

- 8 B. Klahr, J. L. M. Thiesen, O. T. Pinto, T. A. Carniel, and E. A. Fancello, "A variational rve-based multiscale poromechanical formulation applied to soft biological tissues under large deformations," *European Journal of Mechanics - A/Solids*, vol. 99, p. 104 937, 2023, ISSN: 0997-7538.  DOI: <https://doi.org/10.1016/j.euromechsol.2023.104937>.
- 9 J. Z. Lanzendorf, B. Klahr, J. L. M. Thiesen, O. T. Pinto, L. G. Muller, T. A. Carniel, and E. A. Fancello, "On the contribution of solid and fluid behavior to the modeling of the time-dependent mechanics of tendons under semi-confined compression," *Journal: Journal of the Mechanical Behavior of Biomedical Materials*, p. 106 220, 2023.  DOI: <https://doi.org/10.1016/j.jmbbm.2023.106220>.
- 10 B. Klahr, J. L. M. Thiesen, O. T. Pinto, T. A. Carniel, and E. A. Fancello, "An investigation of coupled solution algorithms for finite-strain poroviscoelasticity applied to soft biological tissues," en, *International Journal for Numerical Methods in Engineering*, vol. 123, no. 9, pp. 2112–2141, May 2022, ISSN: 0029-5981, 1097-0207.  DOI: 10.1002/nme.6928. (visited on 01/03/2023).
- 11 H. Brito-Santana, J. L. M. Thiesen, R. de Medeiros, A. J. M. Ferreira, R. Rodríguez-Ramos, and V. Tita, "Multiscale analysis for predicting the constitutive tensor effective coefficients of layered composites with micro and macro failures," en, *Applied Mathematical Modelling*, vol. 75, pp. 250–266, Nov. 2019, ISSN: 0307904X.  DOI: 10.1016/j.apm.2019.05.031. (visited on 01/03/2023).

Conference Proceedings

- 1 J. L. M. Thiesen, M. F. Janczkowski, and E. A. Fancello, "Variationally consistent micropolar homogenization under large deformations," in *Annals of the 5th International Conference on Computational Methods for Multi-scale, Multi-uncertainty and Multi-physics Problems (CM3P)*, Porto, Portugal, 2025.
- 2 L. Branco, O. T. Pinto, J. L. M. Thiesen, B. Klahr, T. A. Carniel, and E. A. Fancello, "Towards the accounting of large poisson's ratios in fiber-reinforced soft biological tissues," in *Annals of the VIII Biomechanical Engineering National Meeting*, Gramado, Brazil, 2024.
- 3 J. L. M. Thiesen, B. Klahr, T. A. Carniel, G. Holzapfel, P. Blanco, and E. A. Fancello, "Second-order computational homogenization scheme for large deformation poromechanics," in *Annals of the 9th International Symposium on Solid Mechanics*, Florianópolis, Brazil, 2024.
- 4 T. A. Carniel, J. Mentges, J. Lanzendorf, *et al.*, "The Role Of The Interstitial Fluids On The Biomechanics Of Tendons: Preliminary Results And Future Directions," in *Annals of the II Meeting of the Post-Graduate Programme in Environmental Sciences of Unochapecó*, Chapecó, Brazil, 2022.
- 5 L. Galibern, G. Brandão, J. L. M. Thiesen, T. Calegatti, K. Kojima, C. Roesler, and E. A. Fancello, "Biomechanical analysis of the locked intramedullary nail in tibial fracture fixation," in *Annals of the VII Biomechanical Engineering National Meeting*, Goiás, Brazil, 2022.
- 6 B. Klahr, O. T. Pinto, J. L. M. Thiesen, T. A. Carniel, and E. A. Fancello, "Conformity of models with and without hydro-mechanical coupling in the representation of chondrocyte biomechanics," in *Annals of the VII Biomechanical Engineering National Meeting*, Goiás, Brazil, 2022.
- 7 B. Klahr, J. L. M. Thiesen, T. A. Carniel, O. T. Pinto, and E. A. Fancello, "Computational modelling of tendons: Poromechanical approach for micro-scales," in *Annals of the XLIII Ibero-Latin American Congress on Computational Methods in Engineering*, Foz do Iguaçu, Brazil, 2022.
- 8 B. Klahr, J. L. M. Thiesen, O. T. Pinto, T. A. Carniel, and E. A. Fancello, "An extension of multiscale variational models to problems involving coupled hydro-mechanical media," in *Annals of 11th European Solid Mechanics Conference*, Galway, Ireland, 2022.
- 9 J. L. M. Thiesen, B. Klahr, O. T. Pinto, T. A. Carniel, and E. A. Fancello, "Effects of controlling stress field evolution in nonlinear poroelastic problems on the efficiency of iteratively-coupled algorithms," in *Annals of the 8th International Symposium on Solid Mechanics*, São Paulo, Brazil, 2022.

- 10 J. L. M. Thiesen, B. Klahr, O. T. Pinto, T. A. Carniel, and E. A. Fancello, "Influence of large deformation kinematics on the definition of permeability models in nonlinear poroelasticity," in *Annals of the VII Biomechanical Engineering National Meeting*, Goiás, Brazil, 2022.
- 11 J. L. M. Thiesen, B. Klahr, T. A. Carniel, and E. A. Fancello, "On fixed-stress and fixed-strain solution schemes for large strain poroelasticity applied to soft biological tissues," in *Annals of the 26th International Congress of Mechanical Engineering*, Florianópolis, Brazil, 2021.
- 12 J. L. M. Thiesen, B. Klahr, T. A. Carniel, and E. A. Fancello, "Poro-mechanical coupling strategies for large strain compression of soft biological tissues," in *Annals of the 42nd Ibero-Latin-American Congress on Computational Methods in Engineering (XLII CILAMCE) and 3rd Pan American Congress on Computational Mechanics (III PANACM)*, Rio de Janeiro, Brazil, 2021.
- 13 J. L. M. Thiesen and R. de Medeiros, "Computational evaluation of the influence of imperfect contact on the behaviour of structures in piezoelectric material," in *Annals of the III Symposium of Numerical Methods in Engineering*, Curitiba, Brazil, 2018.
- 14 J. L. M. Thiesen and R. de Medeiros, "Numerical approach for determining the effective properties of composite materials considering imperfect contact," in *Annals of the 28th Undergraduate Research Seminar*, Joinville, Brazil, 2018.
- 15 J. L. M. Thiesen, L. Crestani, and R. de Medeiros, "Determination of effective properties for structural composite materials," in *Annals of the 27th Undergraduate Research Seminar*, 2017.

Scholarships

Awards and Achievements

- 2024 ■ **Best Graduate Student Paper award in the 9th International Symposium on Solid Mechanics**, Brazilian Society of Mechanical Sciences, Brazil
- 2023 ■ **Ernst Macht Worldwide Scholarship**, Austria
- 2022 ■ **Ph.D. Scholarship, Coordination for the Improvement of Higher Education Personnel (CAPES)**, Brazil.
- 2019 ■ **M.Sc. Scholarship, Coordination for the Improvement of Higher Education Personnel (CAPES)**, Brazil.

Advanced Courses

- 2023 ■ **Variational Methods for Complex Materials and Processes coordinated by Professor Klaus Hackl and Dorothee Knees**. Centre International des Sciences Mécaniques International Centre for Mechanical Sciences (CISM), Italy.
- **Biomechanics, from Protein to Tissue to Organ: Modeling and Computation coordinated by G.A. Holzapfel and R.W. Ogden**. Institute of Biomechanics (TU Graz), Austria.
- 2022 ■ **Introduction to Computational Hemodynamics by Pablo Javier Blanco**. National Laboratory for Scientific Computing (LNCC), Brazil