




# SOTIRIOS KAKALETSIS

Thessaloniki, Greece • [sotirios.kakaletsis@gmail.com](mailto:sotirios.kakaletsis@gmail.com) •  •  •  • [Portfolio](#)

**Research Interests:** Nonlinear Solid Mechanics, Biomechanics, Computational Mechanics

## EDUCATION

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<b>Ph.D., Engineering Mechanics</b> The University of Texas at Austin <i>Research Area:</i> Soft Tissue Biomechanics, Nonlinear Solid Mechanics <i>Advisor:</i> prof. Manuel Rausch	8/2018 - 12/2023
<b>M.S., Engineering Mechanics</b> The University of Texas at Austin	8/2018 - 5/2021 GPA 4.0/4.0
<b>Diploma, Mechanical Engineering</b> Aristotle University of Thessaloniki, Greece <i>Advisor:</i> prof. Sotirios Natsiavas	9/2011 - 11/2016 GPA 8.90/10.0

## EXPERIENCE

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<b>Altair Engineering</b> <i>Software Development Engineer</i> • OptiStruct, Development of structural, implicit analysis software	2/2024 - present Thessaloniki, Greece
<b>Ansys, Inc</b> <i>Computational-Structural Mechanics Intern</i> • Solver evaluation and virtual material testing of reinforced elastomers using embedded elements	5/2023 - 12/2023 Houston, TX, USA
<b>Soft Tissue Biomechanics Lab, UT Austin</b> <i>Graduate Research Assistant</i> • Right ventricular myocardium characterization through inverse finite element analysis • Soft material parameter identification using machine learning • Mechanics and modeling of embedded, discrete fiber networks under large deformation	8/2018 - 12/2023 Austin, TX, USA
<b>Machine Dynamics Laboratory, Aristotle University, Greece</b> <i>Research Assistant</i> • Analytical formulation & implementation of coupler constraints in multibody dynamics • Created a library with multibody showcase models for MotionSolve & MotionView, Altair Engineering	11/2016 - 7/2018 Thessaloniki, Greece

## TECHNICAL SKILLS

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<b>Languages</b>	Python (Scikit-learn, PyTorch), C++, Fortran, Matlab
<b>Finite Element Analysis</b>	OptiStruct, Abaqus, Ansys, FEBio, Ansa & META
<b>Multibody Dynamics</b>	MSC Adams, Altair Motionsolve
<b>Tools</b>	ParaView, LATEX, Autodesk Autocad & Inventor, Adobe Illustrator

## PUBLICATIONS

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- J9. Lin C-Y, Sugerman GP, **Kakaletsis S**, Meador WD, Buganza AT, Rausch MK. *Sex-and age-dependent skin mechanics—A detailed look in mice*. Acta Biomaterialia, 2024
- J8. **Kakaletsis S**, Lejeune E, Rausch MK. *The mechanics of embedded fiber networks*. Journal of the Mechanics and Physics of Solids, 2023

- J7. **Kakaletsis S**, Malinowski M, Mathur M, Sugerman GP, Luci LJ, Snider C, Jazwiec T, Bersi MR, Timek TA, Rausch MK. *Untangling the mechanisms of pulmonary hypertension-induced right ventricular stiffening in a large animal model*. Acta Biomaterialia, 2023
- J6. **Kakaletsis S**, Lejeune E, Rausch MK. *Can machine learning accelerate soft material parameter identification from complex mechanical test data?* Biomechanics and Modeling in Mechanobiology, 2022.
- J5. Meador W, Mathur M, **Kakaletsis S**, Lin C-Y, Bersi M, Rausch MK. *Biomechanical phenotyping of miniscule soft tissues*. Extreme Mechanics Letters, 2022
- J4. Lohr M, Sugerman GP, **Kakaletsis S**, Lejeune E, Rausch MK. *An Introduction to the Ogden Model in Biomechanics – Benefits, Implementation Tools, and Limitations*. Philosophical Transaction of the Royal Society A, 2022
- J3. Rausch MK, Sugerman GP, **Kakaletsis S**, Dortdivanlioglu D. *Hyper-viscoelastic damage modeling of whole blood clot under large deformation*. Biomechanics and Modeling in Mechanobiology, 2021
- J2. **Kakaletsis S**, Meador WD, Mathur M, Sugerman GP, Jazwiec M, Lejeune E, Timek TA, Rausch MK. *Right ventricular myocardial mechanics: Multi-modal deformation, microstructure, modeling, and comparison to the left ventricle*. Acta Biomaterialia, 2021
- J1. Sugerman GP, **Kakaletsis S**, Thakkar P, Chokshi A, Parekh SH, Rausch MK. *A whole blood clot thrombus mimic: Constitutive behavior under simple shear*. Journal of the Mechanical Behavior of Biomedical Materials, 2021

## CONFERENCE PRESENTATIONS

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- C8. Kakaletsis S, Lejeune E, Rausch MK. *Microstructure-Based Estimation Of The Effective Stiffness Of Crosslinked, Embedded Fiber Networks*. Proceedings of the Summer Biomechanics, Bioengineering, and Biotransport Conference, Vail, CO, 2023.
- C7. Kakaletsis S, Lejeune E, Rausch MK. *Investigation of the Poynting Effect of Anisotropic Soft Materials using Embedded, Discrete Fiber Networks*. 2022 Society of Engineering Science Annual Technical Meeting, College Station, TX, 2022.
- C6. Kakaletsis S, Lejeune E, Rausch MK. *How Well Do Constraint Mixture Models Represent Fibrous Soft Tissues? A Comparison Against Embedded, Discrete Fiber Models*. 15th World Congress on Computational Mechanics, Yokohama, Japan (Virtual), 2022.
- C5. Kakaletsis S, Lejeune E, Rausch MK. *Soft Tissue Parameter Identification using Machine Learning*. 7th International Conference on Computational and Mathematical Biomedical Engineering, Milan, Italy, 2022.
- C4. Kakaletsis S, Lejeune E, Rausch MK. *Fibrous Soft Tissue Modelling as Embedded, Discrete Fiber Networks*. 19th U.S. National Congress on Theoretical and Applied Mechanics, Austin, TX, 2022.
- C3. Kakaletsis S, Jazwiec T, Malinowski M, Timek TA, Rausch MK. *Pulmonary hypertension and histomechanics of the right ventricle*. Carnegie Mellon Biomedical Engineering Forum, Virtual, 2021.
- C2. Kakaletsis S, Sugerman GP, Jazwiec T, Malinowski M, Timek TA, Rausch MK. *Mechanics and microstructurally based modeling of the passive right ventricular myocardium*. 16th U.S. National Congress on Computational Mechanics, Virtual, 2021.
- C1. Kakaletsis S, Sugerman GP, Jazwiec T, Malinowski M, Timek TA, Rausch MK. *Histo-mechanics of the passive right ventricular myocardium*. Proceedings of the Annual Summer Biomechanics, Bioengineering, and Biotransport Conference, Virtual, 2021.

## HONORS AND AWARDS

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<b>Eric Baker Becker III Memorial Graduate Scholarship</b> Cockrell School of Engineering, UT Austin.	2022-2023
<b>George J. Heuer, Jr. Ph.D. Endowed Graduate Fellowship</b> Cockrell School of Engineering, UT Austin.	2021-2022
<b>Graduate Continuing Fellowship</b> Graduate School, UT Austin.	2020-2021
<b>Scholarship</b> Hellenic Professional Society of Texas.	2021
<b>John and Mary Wheeler Endowed Graduate Fellowship</b> Cockrell School of Engineering, UT Austin.	2019-2020
<b>Award and Scholarship</b> Greek State Scholarships Foundation (IKY)	2011-2012

## TEACHING

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Teaching assistant for the undergraduate classes:	
EM306 Statics	Fall 2023, Spring 2022
ASE324L Aerospace Materials Laboratory	Spring 2020, Spring 2023
EM311 Dynamics	Fall 2018, Spring 2019, Fall 2019