

TAEKSANG LEE

Myongji University
Division of Mechanical Systems Engineering
116 Myongji-ro, Cheoin-gu, Yongin, 17058, South Korea
Email: taeksanglee@mju.ac.kr | Phone: +82-31-330-6342
Homepage: <http://biomechanics.mju.ac.kr>



EDUCATION

- 2016-2020 **Purdue University**, West Lafayette, IN, USA
Ph.D. in Mechanical Engineering
Advisor: Prof. Adrian Buganza Tepole
Dissertation: Improving Reconstructive Surgery through Computational Modeling of Skin Mechanics
- 2014-2016 **Sungkyunkwan University**, Suwon, South Korea
M.S. in Mechanical Engineering
Advisor: Prof. Moon Ki Kim
Thesis: A Direct Methodology for Prediction of Creep Life Based on Small Punch Creep Test
- 2008-2014 **Sungkyunkwan University**, Suwon, South Korea
B.S. in Mechanical Engineering

EMPLOYMENT AND RESEARCH EXPERIENCE

- 2025-present **Associate Professor**
Division of Mechanical Systems Engineering, Myongji University
Yongin, South Korea
- 2021-2025 **Assistant Professor**
Division of Mechanical Systems Engineering, Myongji University
Yongin, South Korea
- 2020-2021 **Staff Engineer**
Mechatronics R&D Center, Samsung Electronics Co., Ltd
Hwaseong, South Korea
- 2016-2020 **Research Assistant**
School of Mechanical Engineering, Purdue University
West Lafayette, IN, USA

- Summer 2015 **Visiting Student** (sponsored by **BK21 plus**)
 Multiscale Biofabrication and Tissue Engineering Laboratory
 University of Washington at Seattle, Seattle, WA, USA
- 2014-2016 **Research Assistant**
 School of Mechanical Engineering, Sungkyunkwan University
 Suwon, South Korea
- Fall 2013 **Undergraduate Research Assistant**
 School of Mechanical Engineering, Sungkyunkwan University
 Suwon, South Korea
- Winter 2012 **Internship**
 Machinery Design Team, Samsung Heavy Industries Co., Ltd
 Geoje, South Korea

AWARDS AND HONORS

- 2024 **Best paper award**, Korean Society of Biomechanics
- 2023 **Yamaguchi Medal in the field of tissue biomechanics**, Asian-Pacific Association for Biomechanics
- 2022 **Best paper award**, Korean Society of Biomechanics
- 2020 **KSEA-KUSCO Graduate scholarship**, Korean-American Scientists and Engineers Association
- 2019 **KSEA/KOSEN best poster award**, UKC 2019
- 2016 **Excellence award for oral presentation**, School of Mechanical Engineering, Sungkyunkwan University
- 2016 **Outstanding thesis award**, Sungkyunkwan University
- Spring 2013 **Academic merit-based scholarship**, Sungkyunkwan University
- Spring 2009 **Academic merit-based scholarship**, Sungkyunkwan University

JOURNAL PUBLICATIONS

- [24] Yang, Y., Shin, C., Kedir, S. N., Pullagura, B. K., Kim, H., Kaba, A. M., Park, D., **Lee, T.**, and Kim, D., “[Robust acoustofluidic micromixer based on an ultrathin PDMS microballoon oscillator](#),” *Sensors and Actuators B: Chemical*, Vol. 448, Part 1, 139009, 2026.
- [23] Laudo, J., Han, T., Ledwon, J., Figueroa Baker, A., Gosain, A. K., **Lee, T.**, and Buganza Tepole, A., “[Predictive modeling of human skin deformation and growth during tissue expansion in post-mastectomy breast reconstruction](#),” *Journal of Biomechanical Engineering*, Vol. 147(7), 071002, 2025.
- [22] Laudo, J., Han, T., Figueroa Baker, A., Ledwon, J., Gosain, A. K., **Lee, T.**, and Buganza Tepole, A., “[Development and calibration of digital twins for human skin growth in tissue expansion](#),” *Acta Biomaterialia*, Vol 198, pp. 267-280, 2025.

- [21] Kim, S., Kim, Y. H., [Lee, T.](#), and Kim, M. K., “[Development of the Small Punch Fatigue Test Method based on the Finite Element Method](#),” *International Journal of Fatigue*, Vol. 190, 108656, 2025.
- [20] Kim, Y. H.[#], Kim, M. K.[#], Suhr, J., [Lee, T.](#), and Kim, M. K., “[Exploring the Effect of Heat Treatment on the Mechanical Performance of 17-4PH Stainless Steel Specimens fabricated by Metal Additive Manufacturing](#),” *Experimental Mechanics*, Vol. 64, pp. 1333–1342, 2024.
- [19] Hwang, J.[#], Park, J.[#], Choi, J., [Lee, T.](#), Lee, H. C., and Cho, K., “[Self-Assembly of Organic Semiconductors on Strained Graphene under Strain-Induced Pseudo-Electric Fields](#),” *Advanced Science*, Vol. 11(19), 2400598, 2024.
- [18] Kim, S., Ro, U., [Lee, T.](#), and Kim, M. K., “[Evaluation of Creep Properties considering the Friction Effect of the Small Punch Test](#),” *Engineering Fracture Mechanics*, Vol. 298, 109879, 2024.
- [17] Song, G., Gosain, A. K., Buganza Tepole, A., Rhee, K., and [Lee, T.](#), “[Exploring Uncertainty in Hyper-viscoelastic Properties of Scalp Skin through Patient-specific Finite Element Models for Reconstructive Surgery](#),” *Computer Methods in Biomechanics and Biomedical Engineering*, pp.1-15, 2024.
- [16] Han, T., Ahmed, K. S., Gosain, A. K., Buganza Tepole, A., and [Lee, T.](#), “[Multi-Fidelity Gaussian Process Surrogate Modeling of Pediatric Tissue Expansion](#),” *Journal of Biomechanical Engineering*, Vol. 144(12), 121005, 2022.
- [15] Song, G., An, J., Buganza Tepole, A., and [Lee, T.](#), “[Bayesian Inference with Gaussian Process Surrogates to Characterize Anisotropic Mechanical Properties of Skin from Suction Tests](#),” *Journal of Biomechanical Engineering*, Vol. 144(12), 121003, 2022.
- [14] Kim, S., Ro, U., Kim, Y. H., [Lee, T.](#), and Kim, M. K., “[Evaluation of Creep Properties using Small Punch Creep Test for modified 9Cr-1Mo Steel](#),” *Journal of Mechanical Science and Technology*, Vol. 36, pp. 4549–4561, 2022.
- [13] Han, T.[#], [Lee, T.](#)[#], Ledwon, J. K., Vaca, E. E., Turin, S. Y., Kearney, A., Gosain, A. K., and Buganza Tepole, A., “[Bayesian Calibration of a Computational Model of Tissue Expansion based on a Porcine Animal Model](#),” *Acta Biomaterialia*, Vol. 137, pp.136-146, 2022.
- [12] [Lee, T.](#), Holland, M. A., Weickenmeier, J., Gosain, A. K., and Buganza Tepole, A., “[The Geometry of Incompatibility in Growing Soft Tissues: Theory and Numerical Characterization](#),” *Journal of the Mechanics and Physics of Solids*, Vol. 146, 104177, 2021.
- [11] Stowers, C., [Lee, T.](#), Billionis, I., Gosain, A. K., and Buganza Tepole, A., “[Improving Reconstructive Surgery Design using Gaussian Process Surrogates to Account for Material Behavior Uncertainty](#),” *Journal of the Mechanical Behavior of Biomedical Materials*, Vol. 118, 104340, 2021.
- [10] Enriquez, A., Libring, S., Field, T. C., Jimenez, J., [Lee, T.](#), Park, H., Satoski, D., Wendt, M. K., Calve, S., Buganza Tepole, A., Solorio, L., Lee, H., “[High-Throughput Magnetic Actuation Platform for Evaluating the Effect of Mechanical Force on 3D Tumor Microenvironment](#),” *Advanced Functional Materials*, Vol. 31(1), 2005021, 2021.
- [9] [Lee, T.](#)[#], Turin, S. Y.[#], Stowers, C., Gosain, A. K., Buganza Tepole, A., “[Personalized Computational Models of Tissue-Rearrangement in the Scalp Predict the Mechanical Stress Signature of Rotation Flaps](#),” *The Cleft Palate-Craniofacial Journal*, Vol. 58(4), pp.438-445, 2021.
- [8] Janes, L. E., Ledwon, J. K., Vaca, E. E., Turin, S. Y., [Lee, T.](#), Buganza Tepole, A., Gosain, A. K., “[Modeling Tissue Expansion with Isogeometric Analysis: Skin Growth and Tissue Level Changes in the Porcine Model](#)”. *Plastic and Reconstructive Surgery*, Vol. 146(4), pp.792-798, 2020.

- [7] [Lee, T.](#), Billionis, I., Buganza Tepole, A., “[Propagation of Uncertainty in the Mechanical and Biological Response of Growing Tissues using Multi-Fidelity Gaussian Process Regression](#),” *Computer Methods in Applied Mechanics and Engineering*, Vol. 359, 112724, 2020.
- [6] [Lee, T.](#), Gosain, A. K., Billionis, I., Buganza Tepole, A., “[Predicting the Effect of Aging and Defect Size on the Stress Profiles of Skin from Advancement, Rotation and Transposition Flap Surgery](#),” *Journal of the Mechanics and Physics of Solids*, Vol. 125, pp.572-590, 2019.
- [5] [Lee, T.](#), Turin, S. Y., Gosain, A. K., Billionis, I., Buganza Tepole, A., “[Propagation of Material Behavior Uncertainty in a Nonlinear Finite Element Model of Reconstructive Surgery](#),” *Biomechanics and Modeling in Mechanobiology*, Vol. 17(6), pp.1857-1873, 2018.
- [4] [Lee, T.](#), Turin, S. Y., Gosain, A. K., Buganza Tepole, A., “[Multi-View Stereo in the Operating Room Allows Prediction of Healing Complications in a Patient-specific Model of Reconstructive Surgery](#),” *Journal of Biomechanics*, Vol. 74, pp. 202-206, 2018.
- [3] [Lee, T.](#), Vaca, E. E., Ledwon, J. K., Bae, H., Topczewska, J. M., Turin, S. Y., Kuhl, E., Gosain, A. K., Buganza Tepole, A., “[Improving Tissue Expansion Protocols through Computational Modeling](#),” *Journal of the Mechanical Behavior of Biomedical Materials*, Vol. 82, pp. 224-234, 2018.
- [2] [Lee, T.](#)[#], Lee, H.[#], Kang, S. J., Ibupoto, F. A., Lee, J. M., Lee, J. H., Kim, B. J., Choi, J. B., Bae, S., Kim, M. K., “[Small Punch Test and Simulation of HR3C Steel](#),” *Journal of Mechanical Science and Technology*, Vol. 32(7), pp. 3115-3121, 2018.
- [1] [Lee, T.](#), Ibupoto, F. A., Lee, J. H., Kim, B. J., Kim, M. K., “[A Direct Methodology for Small Punch Creep Test](#),” *Experimental Mechanics*, Vol. 56(3), pp. 395-405, 2016.

(# DENOTES EQUAL CONTRIBUTION)

INVITED TALKS AND SEMINARS

- [10] “[Isogeometric Analysis for Quantifying Skin Growth and Predicting Stress in Tissue Expansion and Virtual Reconstructive Surgery](#),” The Bio Engineering Division Conference of KSME, Busan, South Korea, May, 2025
- [9] “[Predictive Modeling and Simulation in Skin Biomechanics for Reconstructive Surgery](#),” The KSME Annual Conference, Jeju, South Korea, November, 2024
- [8] “[Predictive Modeling and Simulation for Soft Tissue Mechanics](#),” Fall Conference of the Korean Society of Computer Assisted Orthopaedic Surgery (CAOS-KOREA), Seoul, South Korea, October, 2024
- [7] “[Computational Modeling and Uncertainty Analysis of Skin Growth induced by Tissue Expansion](#),” The 9th Korea Multi-Scale Mechanics 2023 Symposium, Yeosu, South Korea, December, 2023
- [6] “[Predictive Modeling and Simulation for Soft Tissue Mechanics](#),” School of Mechanical Engineering at Yonsei University, Seoul, South Korea, May, 2023
- [5] “[Predictive Modeling of Soft Tissue Mechanics](#),” Department of Mechanical & System Design Engineering at Hongik University, Seoul, South Korea, April, 2023
- [4] “[Computational Modeling of Skin Mechanics and Uncertainty Analysis in Mechanical and Biological Response of Skin](#),” School of Mechanical Engineering at Sungkyunkwan University, Suwon, South Korea, May, 2022

- [3] [“Computational Modeling of Skin Mechanics and Uncertainty Analysis in Mechanical and Biological Response of Skin,”](#) Korean Society of Medical and Biological Engineering, Virtual Conference, May, 2022
- [2] [“Computational Modeling of Skin Mechanics and Uncertainty Analysis in Mechanical and Biological Response of Skin,”](#) Spring Conference of the Korean Society for Precision Engineering, Jeju, South Korea, May, 2022
- [1] [“Development of Virtual Surgery Simulation using Patient-specific Modeling and Study on the Effect of Uncertainty over Mechanical Properties of Skin,”](#) Annual Conference of the Korean Society of Biomechanics, Seoul, South Korea, December, 2021

CONFERENCE PRESENTATIONS

- [56] [Lee, T.*](#), Ro, U., Kim, S., Kim, M. K., [“Creep constitutive modeling through Gaussian process with monotonicity enabled by expectation propagation,”](#) 18th US National Congress on Computational Mechanics, Chicago, Illinois, July, 2025
- [55] Fidinillah, T.* , Shin, C., Kim, T., Kwak, D., [Lee, T.](#), [“Needle injection simulations using high-fidelity finite element model of human scalp tissue,”](#) The Bio Engineering Division Conference of KSME, Busan, South Korea, May, 2025
- [54] Kim, T.* , Fidinillah, T., Lee, S., Kim, H., [Lee, T.](#), [“Optimization of skin flap design in virtual reconstructive surgery using Isogeometric analysis,”](#) The Bio Engineering Division Conference of KSME, Busan, South Korea, May, 2025
- [53] Fidinillah, T.* , Shin, C., Kim, T., Kwak, D., [Lee, T.](#), [“Development of a Detailed Image-Based Finite Element Model of Skin for Needle Insertion Simulations,”](#) The CAE and Applied Mechanics Division Conference of KSME, Jeju, South Korea, April, 2025
- [52] Kim, T.* , Fidinillah, T., Lee, S., Kim, H., [Lee, T.](#), [“Development of virtual surgery platform for optimizing skin flap design in reconstructive surgery,”](#) The CAE and Applied Mechanics Division Conference of KSME, Jeju, South Korea, April, 2025
- [51] Yitayew, R. G.* , Fidinillah, T.* , Shin, C., Kim, T., Kwak, D., Moon, H., [Lee, T.](#), [“Development of a Detailed Image-Based Finite Element Model of Scalp Skin for In-Silico Suction Test Simulations,”](#) The KSME Annual Conference, Jeju, South Korea, November, 2024
- [50] Kim, T.* , [Lee, T.](#), Sawyer, T. W., [“Early Detection of Gastric Cancer using Optical Coherence Tomography-Based Tissue Strain Calculation and its Application to Surgical Simulation,”](#) Annual Conference of the Korean Society of Biomechanics, Seoul, South Korea, August, 2024
- [49] Yitayew, R. G.* , Fidinillah, T., Shin, C., Kwak, D., [Lee, T.](#), [“Development of a Detailed Image-Based Finite Element Model of Scalp Skin for In-Silico Suction Test Simulations,”](#) Annual Conference of the Korean Society of Biomechanics, Seoul, South Korea, August, 2024
- [48] [Lee, T.*](#), Yitayew, R. G., [“Bayesian Inference for the Analysis of Anisotropic Skin Properties Using Suction Tests and In-Silico Simulation,”](#) Annual Conference of the Korean Society of Biomechanics, Seoul, South Korea, August, 2024
- [47] Laudo, J.* , Han, T., [Lee, T.](#), Figureoa Baker, A., Ledwon, J., Gosain, A. K., Buganza Tepole, A., [“Calibration and Validation of Patient Specific Models of Post-Mastectomy Breast Reconstruction,”](#) 19th International Symposium on Computer Methods in Biomechanics and Biomedical Engineering, Vancouver, Canada, July, 2024
- [46] [Lee, T.*](#), Song, G., Buganza Tepole, A., [“A Bayesian Approach to Characterizing Anisotropic properties of Skin from Suction Tests,”](#) 19th International Symposium on Computer Methods in Biomechanics and Biomedical Engineering, Vancouver, Canada, July, 2024

- [45] Kim, S. *, Kim, Y. H., Lee, T., Kim, M. K., “[Evaluation of fatigue damage in metallic materials using the small punch test](#),” The 10th Korea Multi-Scale Mechanics 2024 Symposium, Seoul, South Korea, July, 2024
- [44] Kim, Y. H. *, Kim, M. K., Lee, T., Kim, M. K., “[Development of a plastic deformation model for 17-4PH metal additive manufacturing using the GTN model](#),” The 10th Korea Multi-Scale Mechanics 2024 Symposium, Seoul, South Korea, July, 2024
- [43] Kim, Y. H. *, Kim, S., Lee, T., Kim, M. K., “[GTN Model for Predicting Ductile Fracture in Metal Additive Manufacturing of 17-4PH](#),” The CAE and Applied Mechanics Division Conference of KSME, Jeju, South Korea, May, 2024
- [42] Kim, S. *, Kim, Y. H., Lee, T., Kim, M. K., “[Development of the fatigue damage evaluation method using the small specimens](#),” The CAE and Applied Mechanics Division Conference of KSME, Jeju, South Korea, May, 2024
- [41] Yitayew, R. G. *, Lee, J., Baek, G., Lee, T., “[Development of Image-based Finite Element Model of Skin and its Application](#),” The CAE and Applied Mechanics Division Conference of KSME, Jeju, South Korea, May, 2024
- [40] Yitayew, R. G. *, Lee, J., Baek, G., Lee, T., “[Development of Image-based Finite Element Model of Human Skin and its Application](#),” The Bio Engineering Division Conference of KSME, Yeosu, South Korea, April, 2024
- [39] Kim, S. *, Ro, U., Lee, T., Kim, M. K., “[Creep Damage Evaluation Method through Small Punch Test](#),” The 9th Korea Multi-Scale Mechanics 2023 Symposium, Yeosu, South Korea, December, 2023
- [38] Kim, Y. H. *, Kim, M. K., Lee, T., Kim, M. K., “[Effect of Heat Treatment and Stacking Orientation on the Strength Properties of 3DP 17-4PH Stainless Steel](#),” The 9th Korea Multi-Scale Mechanics 2023 Symposium, Yeosu, South Korea, December, 2023
- [37] Lee, T. *, Song, G., Baek, G., Lee, J., Lee, J., Yitayew, R. G., “[Uncertainty Analysis in Hyper-viscoelastic Properties of Scalp Skin through Personalized Finite Element Models for Reconstructive Surgery](#),” Joint Conference of the Korean Society of Biomechanics & Korean Society of Sport Biomechanics, Jeonju, South Korea, December, 2023
- [36] Lee, T. *, “[A Bayesian Approach to Characterizing Anisotropic Properties of Skin from Suction Tests](#),” The 12th Asian-Pacific Conference on Biomechanics, Kuala Lumpur, Malaysia, November, 2023
- [35] Lee, T. *, Song, G., Buganza Tepole, A., “[Characterization of Anisotropic Mechanical Properties of Skin using a Suction Device and Bayesian Inference](#),” 17th US National Congress on Computational Mechanics, Albuquerque, New Mexico, July, 2023
- [34] Song, G. *, Shim, G., Gosain, A. K., Buganza Tepole, A., Lee, T., “[Patient-specific Virtual Surgery Simulation using Finite Element Method](#),” 17th US National Congress on Computational Mechanics, Albuquerque, New Mexico, July, 2023
- [33] Song, G. *, Shim, G., Lee, J., Lee, T., “[Uncertainty Analysis over Hyper-viscoelastic Parameters of Skin in Virtual Surgery Simulation](#),” The KSME Spring Conference, Busan, South Korea, May, 2023
- [32] Kim, S. *, Ro, U., Lee, T., Kim, M. K., “[Development of Creep Property Evaluation Method according to Friction of Small Punch Test](#),” The KSME Spring Conference, Busan, South Korea, May, 2023
- [31] Lee, T. *, Song, G., “[Methodology to Measure Anisotropic Properties of Skin using Bayesian Inference](#),” The KSME Spring Conference, Busan, South Korea, May, 2023

- [30] Song, G. *, Shim, G., **Lee, T.**, “[Uncertainty Analysis over Hyper-viscoelastic Properties through Patient-specific Virtual Reconstructive Surgery Simulations](#),” Spring Conference of the Korean Society for Precision Engineering, Jeju, South Korea, May, 2023
- [29] **Lee, T.** *, “[Computational Modeling of Growth and Incompatibility of Soft Tissues using Finite Element Method](#),” Winter Conference of the Biomedical Engineering Society for Circulation, Seoul, South Korea, December, 2022
- [28] Ro, U. *, Kim, S., Kim, Y., **Lee, T.**, Kim, M. K., “[Data-driven Creep Simulation based on Gaussian Process Regression for 9% Cr Steel](#),” International Mechanical Engineering Congress & Exposition, Columbus, Ohio, November, 2022
- [27] Song, G. *, An, J., **Lee, T.**, “[Personalized Computational Models of Scalp Tissue Rearrangement and Stress Analysis](#),” Joint Conference of the Korean Society of Biomechanics & Korean Society of Sport Biomechanics, Chungju, South Korea, November, 2022
- [26] Song, G. *, Buganza Tepole, A., **Lee, T.**, “[Prediction of Mechanical Properties and Anisotropy of Skin through Bayesian Inference](#),” Joint Conference of the Korean Society of Biomechanics & Korean Society of Sport Biomechanics, Chungju, South Korea, November, 2022
- [25] **Lee, T.** *, Buganza Tepole, A., “[Computational Modeling of Skin Growth induced by Tissue Expansion](#),” Joint Conference of the Korean Society of Biomechanics & Korean Society of Sport Biomechanics, Chungju, South Korea, November, 2022
- [24] **Lee, T.** *, “[Uncertainty Analysis in Tissue Growth and Remodeling using Multi-fidelity Gaussian Process Metamodel](#),” Fall Conference of the Korean Society for Precision Engineering, Daegu, South Korea, October, 2022
- [23] Song, G. *, Buganza Tepole, A., **Lee, T.**, “[Mechanical Characterization of Anisotropic Mechanical Properties of Skin using Suction Tests and Bayesian Inference](#),” Fall Conference of the Korean Society for Precision Engineering, Daegu, South Korea, October, 2022
- [22] Song, G. *, An, J., **Lee, T.**, “[Prediction of Stress Signature on Scalp using Personalized Computational Models of Reconstructive Surgery](#),” Fall Conference of the Korean Society for Precision Engineering, Daegu, South Korea, October, 2022
- [21] Ro, U. *, Kim, S., **Lee, T.**, Kim, M. K., “[Machine Learning based Parameter-free Creep Model for 9% Cr Steel](#),” The KSME Spring Conference, Busan, South Korea, May, 2022
- [20] Song, G. *, An, J., **Lee, T.**, “[Personalized Computational Model of Reconstructive Surgery including Viscoelastic Effect of Skin](#),” Spring Conference of the Korean Society for Precision Engineering, Jeju, South Korea, May, 2022
- [19] **Lee, T.** *, Buganza Tepole, A., “[Quantifying Incompatibility in Growing Tissues and Its Connection to Residual Stresses](#),” Summer Biomechanics Bioengineering Biotransport Conference, Virtual Meeting, June, 2020
- [18] **Lee, T.** *, Bilonis, I., Buganza Tepole, A., “[Uncertainty Analysis of Skin Growth During Tissue Expansion Using Multi-Fidelity Gaussian Process Regression](#),” Summer Biomechanics Bioengineering Biotransport Conference, Virtual Meeting, June, 2020
- [17] Stowers, C. *, **Lee, T.**, Bilonis, I., Buganza Tepole, A., “[Understanding the Effect of Material Behavior Uncertainty Including Anisotropy on the Biomechanics of Reconstructive Surgery Flaps Using Surrogate Models](#),” Summer Biomechanics Bioengineering Biotransport Conference, Virtual Meeting, June, 2020
- [16] **Lee, T.**, Turin, S. Y. *, Stowers, C., Gosain, A. K., Buganza Tepole, A., “[Virtual Surgical Planning of Tissue Transfer: Welcome Multi-View Stereo and Finite Element Analysis](#),” 88th American Society of Plastic Surgeons (Plastic Surgery: The Meeting), San Diego, California, September, 2019

- [15] **Lee, T.**^{*}, Buganza Tepole, A., “[Gaussian Process Surrogate Model for Reconstructive Surgery Finite Element Analysis](#),” 32nd US-Korea Conference on Science, Technology, and Entrepreneurship, Rosemont, Illinois, August, 2019
- [14] **Lee, T.**^{*}, Gosain, A. K., Bilonis, I., Buganza Tepole, A., “[Predicting the Effect of Aging and Flap Design on the Mechanical Stress Profiles of Skin Through Gaussian Process Surrogates](#),” 15th US National Congress on Computational Mechanics, Austin, Texas, July, 2019
- [13] **Lee, T.**, Rausch, M. K., Buganza Tepole, A.^{*}, “[Personalized Simulation of Reconstructive Surgery in the Presence of Material Behavior Uncertainty](#),” Biomedical Engineering Society, Atlanta, Georgia, October, 2018
- [12] Turin, S. Y.^{*}, **Lee, T.**, Berg, P., Gosain, A. K., Buganza Tepole, A., “[Application of Finite Element Analysis to Predict Skin Mechanical Stress on a Patient-Specific Model of Complex Local Tissue Rearrangement](#),” 10th Biennial World Society for Simulation Surgery Meeting, Chicago, Illinois, September, 2018
- [11] **Lee, T.**^{*}, Turin, S. Y., Gosain, A. K., Bilonis, I., Buganza Tepole, A., “[Quantifying the Effect of Material Parameter Uncertainty in Patient-Specific, Physics-based Modeling of Reconstructive Surgery](#),” World Congress of Biomechanics, Dublin, Ireland, July, 2018
- [10] **Lee, T.**^{*}, Vaca, E. E., Ledwon, J. K., Bae, H., Topczewsak, J. M., Turin, S. Y., Kuhl, E., Gosain, A. K., Buganza Tepole, A., “[Quantifying Skin Growth due to Tissue Expansion as a Function of Inflation Volume and Protocol Duration](#),” World Congress of Biomechanics, Dublin, Ireland, July, 2018
- [9] **Lee, T.**, Vaca, E. E., Ledwon, J. K., Bae, H., Topczewsak, J. M., Turin, S. Y., Kuhl, E., Gosain, A. K., Buganza Tepole, A.^{*}, “[Understanding Skin Growth in Response to Stretch at Multiple Scales](#),” Engineering Mechanics Institute conference, Boston, Massachusetts, May, 2018
- [8] Vaca, E. E.^{*}, Buganza Tepole, A., **Lee, T.**, Ledwon, J. K., Bae, H., Topczewska, J. M., Gosain, A. K., “[Modeling Tissue Expansion with Isogeometric Analysis: Skin Growth is Correlated with Increased Latency After Expansion](#),” Plastic Surgery Research Council 62nd Annual Meeting, Durham, North Carolina, May, 2017
- [7] Kim, M. K.^{*}, **Lee, T.**, Lee, J. H., Bae, S., “[A Novel Approach of Small Punch Creep Test](#),” International Mechanical Engineering Congress & Exposition, Phoenix, Arizona, November, 2016
- [6] **Lee, T.**^{*}, Kim, M. K., “[An Advanced Creep Life Prediction Method based on Small Punch Creep Test](#),” The KSME Spring Conference, Jeju, South Korea, April, 2016
- [5] **Lee, T.**^{*}, Choi, J. B., Kim, M. K., “[Creep Life Prediction of Pressure Vessels Based on Small Punch Creep Test](#),” The KPVP Annual Conference, Gimcheon, South Korea, November, 2015
- [4] **Lee, T.**^{*}, Kim, M. H., Kim, M. K., “[Study on Equivalent Strain Analysis of Small Punch Creep Test Based on Membrane Stretching Theory](#),” The KSME Autumn Conference, Jeju, South Korea, November, 2015
- [3] **Lee, T.**^{*}, Choi, J. B., Kim, M. K., “[Analytical Study on Small Punch Creep Test for Creep Life Prediction](#),” Mechanical Engineering Seminar, Suwa, Japan, March, 2015
- [2] **Lee, T.**^{*}, Lee, J. H., Kim, B. J., Kim, M. K., Lim, B. S., Ibupoto, F. A., “[Development of a Creep Life Time Expectation Method Based on Small Punch Creep Test](#),” The KIMM Spring Conference, Daegu, South Korea, April, 2014
- [1] Lee, J. H., Kim, M. K., Kim, B. J., **Lee, T.**^{*}, Lim, B.S., “[Small Punch Creep Test Methodology and Life Evaluation](#),” The 2nd ACCEE, Phuket, Thailand, March, 2014

(* DENOTES PRESENTING AUTHOR)

RESEARCH INTERESTS

- **Computational biomechanics of soft tissues:** Nonlinear finite element and isogeometric analysis of patient-specific models for reconstructive surgery, characterization of growth, remodeling, and residual stress in skin and soft tissues.
- **Inelastic behavior of metallic materials:** Experimental and numerical modeling of creep, fatigue, and ductile fracture using small punch tests and advanced constitutive models, plasticity and fracture analysis in additively manufactured alloys.
- **Data-driven modeling and uncertainty quantification:** Development of Bayesian surrogate models and Gaussian process regression with multi-level/multi-fidelity data, reduced-order and machine learning approaches to propagate uncertainty in complex nonlinear and multiphysics systems across both biological and metallic materials.

TEACHING EXPERIENCE

- **Continuum Mechanics, Graduate Level**
Spring 2026
Mechanical Engineering, Myongji University, Yongin, South Korea
- **Finite Element Method, Graduate Level**
Spring 2025
Mechanical Engineering, Myongji University, Yongin, South Korea
- **Applied Mathematics I, Graduate Level**
Fall 2022, 2023, 2024, and 2025
Mechanical Engineering, Myongji University, Yongin, South Korea
- **Machine Component Design, Undergraduate Level**
Spring 2023, 2024, 2025, and 2026
Mechanical Engineering, Myongji University, Yongin, South Korea
- **Finite Element Method, Undergraduate Level**
Spring 2022, 2023, 2024, 2025, and 2026
Mechanical Engineering, Myongji University, Yongin, South Korea
- **Solid Mechanics, Undergraduate Level**
Spring 2022
Mechanical Engineering, Myongji University, Yongin, South Korea
- **Introduction to Engineering Design, Undergraduate Level**
Fall 2021, 2022, and 2023
Mechanical Engineering, Myongji University, Yongin, South Korea
- **Introduction to Finite Element Analysis, Undergraduate Level**
Fall 2018, Spring & Fall 2019

Teaching Assistant, Mechanical Engineering, Purdue University, West Lafayette, IN, USA

- **Solid Mechanics Design Laboratory**, Undergraduate Level
Fall 2014, Spring & Fall 2015
Teaching Assistant, Mechanical Engineering, Sungkyunkwan University, Suwon, South Korea
- **Microstructure and Mechanical Properties**, Graduate Level
Spring 2014
Teaching Assistant, Mechanical Engineering, Sungkyunkwan University, Suwon, South Korea

ACADEMIC SERVICE

- **Reviewer**
Acta Biomaterialia | Engineering with Computers | International Journal of Precision Engineering and Manufacturing | Computer Methods and Programs in Biomedicine | Biomechanics and Modeling in Mechanobiology | Next Research | International Journal of Mechanical Sciences | Scientific Reports | International Journal of Pressure Vessels and Piping | Journal of Biomechanical Engineering | Thin-Walled Structures | European Journal of Mechanics / A Solids | Journal of Biomechanics | Skin Research and Technology
- **Board Member**
Bio Engineering Division in Korean Society of Mechanical Engineers | CAE and Applied Mechanics Division in Korean Society of Mechanical Engineers | Korean Society of Biomechanics | Bio & Health section in Korean Society for Precision Engineering | The Korean Orthopaedic Research Society