

ERIN M. LOUWAGIE

erin.louwagie@columbia.edu
erinmlouwagie.com
www.linkedin.com/in/erin-louwagie

EDUCATION

Columbia University, New York, NY

Ph.D., Mechanical Engineering

October 2024

M.S., Mechanical Engineering (GPA: 3.90)

February 2020

University of Minnesota - Twin Cities, Minneapolis, MN

B.S., Mechanical Engineering, High Distinction (GPA: 3.93)

May 2018

AWARDS

- 2023 USNCCM17 Travel Award
- Finalist in 2023 Summer Biomechanics, Bioengineering, and Biotransport Conference PhD Student Paper competition in Tissue Engineering, Remodeling, and Emerging Areas
- First Place in the 2023 Columbia 3 Minute Thesis Competition
 - Available: <https://www.youtube.com/watch?v=yrNdVYTkFOQ>
- 2022 VPH Travel Funding Award
- 2020 NIH Interagency Modeling and Analysis Group - Amplifying Impact by Nurturing Diversity Futures Trainee Poster Competition Honorable Mention
- NSF Graduate Research Fellowship Honorable Mention 2018, 2020
- Blavatnik Doctoral Fellow 2018
- Columbia University Presidential Scholar 2018
- Third Place in the 2017 Summer Biomechanics, Bioengineering, and Biotransport Conference BS Student Paper competition in Dynamics & Injury, Devices, and Imaging

RESEARCH EXPERIENCE

Oyen Lab

Wayne State University

Postdoctoral Researcher

November 2024 – September 2025

Advisor: Professor Michelle Oyen

My work as a postdoctoral researcher in the Oyen lab continued in the area of engineering in women's health with the further development of computational tools to study pregnancy and improve healthcare. I developed a pipeline to better stratify pregnancies at risk for fetal growth restriction and stillbirth using radiomic analysis of ultrasound images. Additionally, I built a parametric patient-specific model of the second-trimester uterus that includes a cesarean section scar, which will be used to investigate how scar presence and location may lead to preterm birth. Outside of these projects, my responsibilities included REDCap database construction, mentoring masters students in their individual research projects, and writing and presenting technical communications for journals and conferences.

Myers Soft Tissue Lab

Columbia University in the City of New York

Graduate Research Assistant

January 2019 – May 2024

Postdoctoral Researcher

April 2026 – Present

Advisor: Professor Kristin Myers

The goal of my doctoral research was the development of a finite element analysis workflow for patient-specific models of pregnant maternal anatomy for improved prediction of preterm birth. This workflow is based on clinically implementable measurements, with parametric patient-specific solid models generated from 2D ultrasonic measurements and cervical stiff-

ness obtained from cervical aspiration. In pursuing this goal, I developed standard operating procedures for observational clinical studies that were HIPAA and IRB compliant, worked directly with obstetricians and sonographers in the clinical setting to gather measurements, interpreted ultrasound images for clinician review, developed a solid and finite element modeling workflow, conducted sensitivity studies on the modeling workflow, and implemented the workflow in patient cohorts at high- and low-risk for preterm birth. My other responsibilities include collaborating with faculty inside and outside Columbia, co-managing the biological and chemical safety of the lab, writing and presenting technical communications for journals, conferences, and grants, managing the lab website, developing and recording video tutorial series for training incoming lab members, and mentoring students in the lab. As a postdoctoral researcher under Professor Myers, I continue to work on computational approaches to model pregnancy and publishing my doctoral research.

Kasza Living Materials Lab

Graduate Research Assistant

Columbia University in the City of New York

September 2018 – December 2018

Advisor: Professor Karen Kasza

The main objective of my work was to investigate cell crawling through image acquisition of *Drosophila* embryos with optogenetic tool expression control. My responsibilities included *Drosophila* husbandry, lab upkeep duties, and operation of confocal microscopes. I also designed and fabricated embryo mounting hardware for confocal microscopy.

Bioheat and Mass Transfer Lab

Undergraduate Research Assistant

University of Minnesota - Twin Cities

May 2015 – May 2018

Advisor: Professor John Bischof

My work focused on verification of a thermal contrast amplification device, utilizing a LabVIEW controlled system of a laser and infrared camera to detect heat signatures of lateral flow assays. My main responsibilities were testing lateral flow assays on the thermal contrast amplification device, training collaborators at the Mayo Clinic and new lab members to use the device, and design and fabrication of an organization system for lateral flow assays. My other responsibilities included writing and presenting technical communications for journals and conferences.

Assistive Robotics Technology REU

Lead Undergraduate Researcher

University of Wisconsin - Stout

June 2016 – August 2016

Advisor: Professor Wei Shi

My work focused on developing a semi-autonomous meal assistance robot using a Kinova JACO arm and Microsoft Kinect, using facial expressions to control robotic arm movement. My responsibilities included leading a team of three undergraduate researchers, conducting literature searches, developing the research project timeline, documenting project progress, directing team meetings, and communicating progress with mentor. I also arranged for a field test of the robot with an individual with an upper extremity disability through collaboration with the UW-Stout Rehabilitation and Counseling Department.

PUBLICATIONS

Peer-Reviewed

1. Olivia Mergler, Abigail Laughlin, **Erin Louwagie**, Lei Shi, Kristin Myers, and Vijay Vedula, "A Method for Image-Based Modeling of Uterine Passive Mechanics During Late Pregnancy," *Submitted to Annals of Biomedical Engineering*.
2. Alice M. Collier, **Erin M. Louwagie**, José M. Peña, Kristin Myers, Antoine Jerusalem, "Predicting the risk of vaginal labor related injuries before birth, a mechanistics-informed machine learning approach," *Submitted to npj Women's Health*.
3. Abigail Laughlin, **Erin Louwagie**, Adriana Delagarza, Hannah Haider, Mirella Mourad, Michael

- House, and Kristin Myers, "Computational simulations of pregnancy show biomechanical benefit of cervical cerclage," *Submitted to American Journal of Obstetrics and Gynecology*.
4. **Erin M. Louwagie**, Hannah Haider, Camilo A. Duarte, Lei Shi, Mirella Mourad, Michael House, Helen Feltovich, and Kristin Myers, "A finite element model of pregnancy derived from maternal sonography: effect of uterine and cervical structural properties on cervical mechanical loading," *Journal of Biomechanical Engineering*, In Press, doi: <https://doi.org/10.1115/1.4072672>.
 5. Adrienne K. Scott, **Erin M. Louwagie**, Edward P. Chandler, Caroline Fosher, Abigail Arter, Fran Manyx, Patrick Yang, Samyuktha S. Kolluru, Ulugbeck S. Kamilov, Anthony B. Odibo, and Michelle L. Oyen, "Integrated quantitative biomarkers of placental texture and hemodynamics improve assessment of pregnancies at risk for adverse fetal outcomes", *Placenta*, In Press, doi: 10.1016/j.placenta.2026.07.011.
 6. **Erin M. Louwagie**, Serena R. Russell, Jacqueline C. Hairston, Claire Nottman, Chia-Ling Nhan-Chang, Karin Fuchs, Cynthia Gyamfi-Bannerman, Whitney Booker, Maria Andrikopoulou, Alexander Friedman, Noelia Zork, Ronald Wapner, Joy Vink, Mirella Mourad, Helen M. Feltovich, Michael D. House, and Kristin M. Myers, "The biomechanical evolution of the uterus and cervix and fetal growth in human pregnancy", *npj Womens Health*, 2(1):1-9, 2024. doi: 10.1038/s44294-024-00038-8.
 7. Alice Collier, **Erin Louwagie**, Ghaidaa Khalid, Mike Jones, Kristin Myers, and Antoine Jerusalem, "Effects of fetal position on the loading of the fetal brain during the onset of the second stage of labour", *Journal of Biomechanical Engineering*, 146(11):111001, 2024. doi: 10.1115/1.4065557.
 8. Daniel S. Fidalgo, Renato Natal Jorge, Marco Parente, **Erin Louwagie**, Ewelina Malanowska, Kristin Myers, and Dulce Oliveira, "Pregnancy stage before the onset of labor: a holistic mechanical perspective", *Biomechanics and Modeling in Mechanobiology*, 23:1531-1550, 2024. doi: 10.1007/s10237-024-01853-3.
 9. **Erin M. Louwagie**, Divya Rajasekharan, Arielle Feder, Shuyang Fang, Chia-Ling Nhan-Chang, Mirella Mourad, and Kristin M. Myers, "Parametric solid models of the at-term uterus from magnetic resonance images," *Journal of Biomechanical Engineering*, 146(7):071008, 2024. doi: 10.1115/1.4065109.
 10. Adrienne K. Scott, **Erin M. Louwagie**, Kristin M. Myers, and Michelle L. Oyen, "Biomechanical Modeling of Cesarean Section Scars and Scar Defects," in *CMBBE 2023 in Computer Methods In Biomechanics and Biomedical Engineering II, Lecture Notes in Computational Vision and Biomechanics* 39:67-76, 2024. doi: 10.1007/978-3-031-55315-8_8.
 11. **Erin Louwagie**, Lindsey Carlson, Veronica Over, Lu Mao, Shuyang Fang, Andrea Westervelt, Joy Vink, Timothy Hall, Helen Feltovich, and Kristin Myers, "Longitudinal ultrasonic dimensions and parametric solid models of the gravid uterus and cervix," *PLOS ONE*, 16(1)e0242118, 2021. doi: 10.1371/journal.pone.0242118.
 12. Yiru Wang, **Erin Louwagie**, Daniel Larkin, Stephanie Sankey, David Boulware and John Bischof, "Improved detection of group A Streptococcus during thermal contrast amplification vs. visual reading of clinical rapid diagnostic tests," *Analytical Methods*, 11(15):2013-2017, 2019. doi: 10.1039/c8ay02125b.

In Preparation

1. **Erin M. Louwagie**, Adrienne K. Scott, Edward P. Chandler, Bonnie Lowry, Yuyang Hu, Caroline Fosher, Abigail Arter, Patrick Yang, Anthony B. Odibo, Ulugbeck S. Kamilov, and Michelle L. Oyen, "Texture analysis of placental ultrasound images," *In preparation, current version available via Zenodo*: <https://doi.org/10.5281/zenodo.18396381>.
2. Adriana Delagarza, Abigail W. Laughlin, **Erin M. Louwagie**, Hannah Z. Haider, Camilo Duarte, Alicia B. Dagle, Mirella Mourad, Michael D. House, and Kristin M. Myers, "High-Resolution 3D Solid Models of the Second-Trimester Human Cervix in Low-Risk Pregnancies", *In Preparation*.

3. **Erin M. Louwagie**, Alicia Wang, Abigail W. Laughlin, Jacqueline C. Hairston, Serena R. Russell, Chia-Ling Nhan-Chang, Mirella Mourad, and Kristin M. Myers, "Digital models of uterine anatomy during pregnancy and postpartum", *In Preparation*.
4. **Erin Louwagie**, Alara Sutcu, Andrea Westervelt, Jacqueline Hairston, Abigail Laughlin, Serena Russell, Alicia Dagle, Susan Pollak, Sofia Moscovitz, Opeyemi Lekan, Joy Vink, Chia-Ling Nhan-Chang, Cynthia Gyamfi-Bannerman, Uma Reddy, Matthew Hoffman, Ronald Wapner, Anne-Catrin Uhlemann, Renu Nandakumar, Aya Brown Kav, Tal Korem, Kristin Myers, and Mirella Mourad, "Cervical pessary alters cervicovaginal immune profile but not cervical biomechanical response," *In preparation*.

Book Chapters

1. Daniella Fodera and **Erin Louwagie**, "The Structure and Function of the Uterus and Cervix Across the Reproductive Lifespan: Considerations for Biomaterial Design," In: Samantha Zambuto and Michelle Oyen (eds) *Biomaterials for Women's Health Engineering*, Springer, Cham, 2026.
2. **Erin Louwagie** and Daniella Fodera, "Biomechanics of the Uterus and Cervix Across Pregnancy and Disease: Considerations for Biomaterial Design," In: Samantha Zambuto and Michelle Oyen (eds) *Biomaterials for Women's Health Engineering*, Springer, Cham, 2026.

TEACHING EXPERIENCE

Teaching Assistant			
Term	Course Number	Course Title	Number of Students
Fall 2022	MECE E3100	Intro to Mechanics of Fluids	83
Fall 2023	MECE E3100	Intro to Mechanics of Fluids	70

Guest Lectures

- March 2026, "Cervix: constituents, structure, function, and engineering", Course: Reproductive Tissue Engineering (ME599-699), University of Kentucky
- April 2025, "Cervix: constituents, structure, function, and engineering", Course: Engineering for Women's Health (5995 Special Topics in Biomedical Engineering I), Wayne State University
- March 2025, "Cervix: constituents, structure, function, and engineering", Course: Reproductive Tissue Engineering, University of Kentucky

MENTORING EXPERIENCE

- 2025: Mentor for masters students in Professor Michelle Oyen's lab at Wayne State University
 - **Bonnie Lowry** (May 2025 - August 2025)
Summer 2025 Project: Parametrically modeling the fetus
 - **Gillian Szwabowski** (January 2025 - August 2025)
Wayne State University Masters Student, Class of 2026
Spring, Summer 2025 Project: Parametrically and manually modeling the uterus and placenta
- 2019-2024: Mentor for masters, undergraduate, and high school students in Professor Kristin Myers' lab at Columbia University
 - **Claire Nottman** (May - August 2023)
Columbia University Biomedical Engineering Undergraduate Student, Class of 2025
Summer 2023 Project: Statistical analysis of longitudinal measurements of pregnant anatomy at low-risk for preterm birth

- **Colin Edwards** (January - May 2023)
Columbia University Mechanical Engineering Masters Student, Class of 2024
 Spring 2023 Project: Method to quantitatively compare computational analysis results from different patient-specific models
- **Sarah Crovella** (January - May 2023)
Columbia University Mechanical Engineering Undergraduate Student, Class of 2024
 Spring 2023 Project: Design and Implementation of Puncture Tests for Fetal Membranes
- **Bernard Liebeskind** (January - May 2023)
Columbia University Mechanical Engineering Undergraduate Student, Class of 2025
 Spring 2023 Project: Improving patient-specific parametric modeling workflow
- **Yuvna Musuku** (August 2022 - January 2023)
High School Student, Class of 2023
 Fall 2022 - Spring 2023: Computationally modeling a device to prevent perineal tears
- **Miccaella Lejwa** (June - August 2022)
2022 Columbia University-Amazon SURE Student
 Summer 2022 Project: Cervical Loading in Patients at Low-Risk for Preterm Birth for Tied and Sliding Fetal Membranes
 Miccaella's summer 2022 presentation is available:
<https://kristinmyerscolumbia.com/people/miccaella-lejwa/>
- **Adriana Delagarza** (Jan 2022 - May 2024)
Columbia University Mechanical Engineering Undergraduate Student, Class of 2025
 Spring 2022 Project: Shape characterization in second trimester cervixes at low-risk for preterm birth
 Fall 2022 Project: Effect of cervical shape in simulations of human pregnancy
 Spring 2023 - Present Project: Effect of cervical shape in *in-silico* simulations of *in-vivo* cervical aspiration measurements (*Finalist in SB3C 2024 BS level Student Paper Competition in Image-Based Measurement, Analysis, and Modeling*)
- **Jada Hinds** (June - August 2021)
2021 Columbia University-Amazon SURE Student
 Summer 2021 Project: Effects of maternal ultrasonic parameter values on cervical loading
 Jada's summer 2021 presentation is available:
<https://kristinmyerscolumbia.com/people/jada-hinds/>
- **Arielle Feder** (May 2020 - August 2022)
Columbia University Mechanical Engineering Undergraduate Student, Class of 2022
 Summer 2020 Project: Late Pregnancy Uterus Model and Modelling the Vaginal Canal
 Fall 2020 - Spring 2022 Project: Parametric patient-specific model simulation human cervix deformation during the first stage of labor (*Runner-up in SB3C 2021 BS level Student Paper Competition in Soft Tissues section*)
- **Divya Rajasekharan** (September 2019 - September 2020)
Columbia University Mechanical Engineering Undergraduate Student, Class of 2021
 Summer 2020 Project: Late Pregnancy Uterus Model and Modelling the Pelvic Bone
 Arielle and Divya's summer 2020 presentations are available:
 1. Late Pregnancy Uterus Model - <https://doi.org/10.7916/d8-p164-vg61>
 2. Modeling the Pelvic Bone and Vaginal Canal - <https://doi.org/10.7916/d8-f3kp-e229>
- **Anabella Advincula** (September 2019 - September 2020)
High School Student, Class of 2020
 Summer 2020 Project: Columbia University Summer Design Challenge, Reimagining Prenatal Care
 Anabella's summer 2020 presentation is available:
<https://kristinmyerscolumbia.com/2020/09/21/myers-lab-summer-research-projects/>

- 2018: Mentor for undergraduate student as a part of the SWE UMN mentorship program, provided academic and professional advice
- 2017-2018: Lab monitor for the University of Minnesota's Anderson Labs, taught students to use common shop tools, 3D printers, laser cutters, and created training tools
- 2016-2017: Peer tutor for the University of Minnesota's Taylor Tutoring center, provided academic support to freshmen in physics, calculus, and chemistry

INDUSTRY EXPERIENCE

Vigilant Diagnostics

Stillwater, MN

Product Development Contractor

May 2018 to Aug 2018

- Designed and fabricated universal lateral flow assay mount for rapid diagnostic test unit
- Documented build and installation process for rapid diagnostic test unit
- Assessed laser to be used in improvement of sensitivity of lateral flow assays

GE Power

Waukesha, WI

EID Intern

June 2017 to Aug 2017

- Supported experienced engineers in the validation and documentation of new engine system manager
- Created a quick start guide to aid customers in the first use of the product
- Designed a solution to efficiently mount four human-machine interfaces to minimize space used while remaining accessible

CONFERENCE PROCEEDINGS AND ABSTRACTS

1. Abigail Laughlin, **Erin Louwagie**, Adriana Delagarza, Hannah Haider, Mirella Mourad, Michael House, and Kristin Myers, "Biomechanical Benefit of Cervical Cerclage During Pregnancy: a Computational Study," Oral Presentation, 2026 Virtual Physiological Human Conference, Milan, Italy, September 1-4, 2026.
2. Abigail Laughlin, **Erin Louwagie**, Adriana Delagarza, Lei Shi, Michael House, Mirella Mourad, and Kristin Myers, "Patient-Specific Cervical Material Stiffness Quantified From In-Vivo Aspiration and Ultrasound-Derived Pregnancy In-Silico Model," Oral Presentation, 2026 Virtual Physiological Human Conference, Milan, Italy, September 1-4, 2026.
3. Echo Xu, **Erin Louwagie**, Teseo Schneider, Denis Zorin, Daniele Panozzo, and Kristin Myers, "Uterin Deformation Trajectories Across Gestation Reveal the Evolving Mechanical State of Pregnancy," Oral Presentation, 2026 Virtual Physiological Human Conference, Milan, Italy, September 1-4, 2026.
4. Alara Sutcu, **Erin Louwagie**, Aya Brown Kav, Julia Urban, Susan Pollak, Renu Nandakumar, Mirella Mourad, Jacqueline Hairston, Kristin Myers, and Tal Korem, "Cervicovaginal Immune Factors are Associated with Spontaneous Preterm Birth," Poster Presentation, Society of Reproductive Investigation 73rd Annual Scientific Meeting, San Juan, PR, March 24-28, 2026.
5. Adrienne Scott, **Erin Louwagie**, Edward Chandler, Samyuktha Kolluru, Caroline Fosher, Abigail Arter, Fran Manyx, Ulugbek Kamilov, Anthony Odibo, and Michelle Oyen, "Predicting Stillbirth Risk Factors with Ultrasound Texture Analysis and Doppler Imaging of the Placenta," Poster Presentation, Society of Reproductive Investigation 73rd Annual Scientific Meeting, San Juan, PR, March 24-28, 2026.
6. Jacqueline Hairston, Christy Ghandi, Shahd ElNaggar, Elizabeth Vitaro, Alicia Dagle, **Erin Louwagie**, Alara Sutcu, Abigail Laughlin, Maria Andrikopoulou, Amy Turitz, Tal Korem, Kristin Myers, and Mirella Mourad, "Prospective Quantitative Assessment of Cervical Stiffness and Recurrence of Spontaneous Preterm Birth," Poster Presentation, Society of Reproductive Investigation 73rd Annual Scientific Meeting, San Juan, PR, March 24-28, 2026.
7. **Erin Louwagie**, Adrienne Scott, Edward Chandler, Caroline Fosher, Anthony Odibo, Ulug-

- bek Kamilov, and Michelle Oyen,, "Assessment of Placental Microstructure via Ultrasonic Texture Analysis for Diagnosing Fetal Growth Restriction," Poster Presentation, Biomedical Engineering Society 2025 Annual Meeting, San Diego, CA, October 8–12, 2025.
8. Gillian Szabowski, **Erin Louwagie**, and Michelle Oyen, "3D Modeling of the Uterus and Placenta During Pregnancy," Poster Presentation, Biomedical Engineering Society 2025 Annual Meeting, San Diego, CA, October 8–12, 2025.
 9. **Erin Louwagie**, Adrienne Scott, Edward Chandler, Caroline Fosher, Abigail Arter, Fran Manyx, Patrick Yang, Anthony Odibo, Ulugbek Kamilov, and Michelle Oyen, "Texture features from placental ultrasound images: distinguishing severe fetal growth restriction," Oral Presentation, 20th International Symposium on Computer Methods in Biomechanics and Biomedical Engineering, Barcelona, Spain, September 3–5, 2025.
 10. **Erin Louwagie**, Adrienne Scott, Amrita Banerjee, Maria Ivan, Abigail Laughlin, Kristin Myers, Raffaele Napolitano, Anna David, and Michelle Oyen, "Biomechanical Effects of Cesarean Section Scar Location and Niche Presence on the Second Trimester Maternal Anatomy", Oral Presentation, Summer Bioengineering Conference 2025, Santa Ana Pueblo, NM, June 22-25, 2025.
 11. Abigail Laughlin, **Erin Louwagie**, Michael House, Mirella Mourad, and Kristin Myers, "Computational Simulations of Pregnancy Show Biomechanical Benefit of Cervical Cerclage", Oral Presentation, Summer Bioengineering Conference 2025, Santa Ana Pueblo, NM, June 22-25, 2025.
 12. **Erin Louwagie**, Adrienne Scott, Kristin Myers, and Michelle Oyen, "Biomechanical Effects of Cesarean Section Scars on Second Trimester Pregnant Anatomy", Poster Presentation, Injury Biomechanics Symposium 2025, Columbus, OH, May 18-20, 2025.
 13. Abigail Laughlin, Adriana Delagarza, **Erin Louwagie**, Jacqueline Hairston, Mirella Mourad, Michael House, and Kristin Myers, "In-Silico Models of In-Vivo Cervical Stiffness Measurements for Improving Preterm Birth Prediction", Poster Presentation, Engineering for Women's Health Conference 2024, Boston, MA, September 16, 2024. (*First place in poster competition*)
 14. Adriana Delagarza, **Erin Louwagie**, Abigail Laughlin, Jacqueline Hairston, Mirella Mourad, Michael House, and Kristin Myers, "In-Silico Models of In-Vivo Cervical Stiffness Measurements for Improving Preterm Birth Prediction", Poster Presentation, 2024 Summer Biomechanics, Bioengineering and Biotransport Conference, Lake Geneva, WI, June 11-14, 2024. (*Finalist in BS level Student Paper Competition in Image-Based Measurement, Analysis, and Modeling*)
 15. Abigail Laughlin, **Erin Louwagie**, Devon Campbell, Michael House, and Kristin Myers, "Biomechanical Modeling of Cervical Support During Pregnancy: Implication for the Treatment of Cervical Insufficiency", Poster Presentation, Society of Maternal-Fetal Medicine Pregnancy Meeting, National Harbor, MD, February 10-14, 2024.
 16. **Erin Louwagie**, Serena Russell, Jacqueline C. Hairston, Chia-Ling Nhan-Chang, Karin Fuchs, Cynthia Gyamfi-Bannerman, Whitney A. Booker, Maria Andrikopoulou, Alexander M. Friedman, Noelia Zork, Ronald J. Wapner, Joy Vink, Mirella Mourad, and Kristin Myers, "Serial Measurements of Ultrasonic Dimensions of Gravid Maternal Anatomy and Aspirated Cervical Stiffness", Poster Presentation, Society of Maternal-Fetal Medicine Pregnancy Meeting, National Harbor, MD, February 10-14, 2024.
 17. Mirella Mourad, Jacqueline C. Hairston, Abigail Laughlin, **Erin Louwagie**, Chia Ling Nhan Chang, Qi Yan, Uma M. Reddy, and Kristin Myers, "Aspirated and Computed Cervical Stiffness Throughout Gestation for Patients With and Without a Pessary", Poster Presentation, Society of Maternal-Fetal Medicine Pregnancy Meeting, National Harbor, MD, February 10-14, 2024.
 18. **Erin Louwagie**, Jada Hinds, Lindsey Carlson, Timothy Hall, Helen Feltovich, and Kristin My-

- ers, "Maternal Anatomy Drives Mechanical Loading in the Proximal Cervix", Oral Presentation, 17th U.S. National Congress on Computational Mechanics, Albuquerque, NM, July 23-27, 2023.
19. **Erin Louwagie**, Jacqueline Hairston, Mirella Mourad, Ronald Wapner, and Kristin Myers, "Biomechanical Integrity of the Cervix in Patients at Low- and High-Risk of Preterm Birth", Oral Presentation, 28th Congress of the European Society of Biomechanics, Maastricht, the Netherlands, July 9-12, 2023.
 20. **Erin Louwagie**, Jada Hinds, Lindsey Carlson, Timothy Hall, Helen Felotvich, and Kristin Myers, "Maternal Anatomy Drives Mechanical Loading in the Proximal Cervix during Pregnancy", Oral Presentation, 2023 Summer Biomechanics, Bioengineering and Biotransport Conference, Vail, CO, June 4-8, 2023.
 21. **Erin M. Louwagie**, Mirella Mourad, Michael House, Ronald Wapner, and Kristin Myers, "An In-silico Mechanical Test to Study Cervical Loading in Patients at Low- and High-Risk for Preterm Birth", Oral Presentation, 18th International Symposium on Computer Methods in Biomechanics and Biomedical Engineering, Paris, France, May 3-5, 2023.
 22. Adrienne Scott, **Erin Louwagie**, Kristin Myers, and Michelle Oyen, "Biomechanical Modeling of C-section Scar", Poster Presentation, Society of Reproductive Investigation Annual Meeting, Brisbane, Australia, March 21-25, 2023.
 23. Jacqueline C. Hairston, **Erin M. Louwagie**, Serena Russell, Chia-Ling Nhan-Chang, Amy Turitz, Uma Reddy, Cynthia Gyamfi-Bannerman, Joy Vink, Kristin M. Myers, and Mirella Mourad, "Quantifying Cervical Stiffness in Patients with a Short Cervix", Poster Presentation, Society of Reproductive Investigation Annual Meeting, Brisbane, Australia, March 21-25, 2023.
 24. **Erin Louwagie**, Mirella Mourad, Michael House, Ronald Wapner, and Kristin Myers, "Effect of Foetal Membrane Adhesion on Stretch in the Foetal Membrane and Cervix", Oral Presentation, 2022 Virtual Physiological Human Conference, Porto, Portugal, September 6-9, 2022.
 25. **Erin Louwagie**, Mirella Mourad, Michael House, Ronald Wapner, and Kristin Myers, "Cervical Loading in Patients at High- and Low-risk for Preterm Birth", Poster Presentation, 2022 World Congress of Biomechanics, Taipei, Taiwan, July 14-18, 2022.
 26. **Erin Louwagie**, Jada Hinds, Lindsey Carlson, Timothy Hall, Helen Feltovich, and Kristin Myers, "Effects of maternal anatomy on cervical loading: a sensitivity study", Oral Presentation, 2022 European Solid Mechanics Conference, Galway, Ireland, July 4-8, 2022.
 27. **Erin Louwagie**, Mirella Mourad, Michael House, Ronald Wapner, and Kristin Myers, "Simulation of the gravid human uterus and cervix for patients at high- and low-risk for preterm birth", Oral Presentation, Summer Biomechanics, Bioengineering and Biotransport Conference, Eastern Shore, MD, June 20-23, 2022.
 28. **Erin Louwagie**, Mirella Mourad, Michael House, Ronald Wapner, and Kristin Myers, "Cervical Loading in Patients at High- and Low-risk for Preterm Birth", Poster Presentation, 2022 Northeast Bioengineering Conference, New York, NY, April 23-24, 2022.
 29. Arielle Feder, Divya Rajasekharan, **Erin Louwagie**, Mirella Mourad, and Kristin Myers, "Parametric Solid Models of the At-term Uterus from 2D Ultrasound and MRI", Poster Presentation, 2022 Northeast Bioengineering Conference, New York, NY, April 23-24, 2022.
 30. **Erin Louwagie**, Mirella Mourad, Joy Vink, and Kristin Myers, "Comparing Computational Parametric Models of Patients who Delivered Preterm and At-term", Oral Presentation, 17th International Symposium on Computer Methods in Biomechanics and Biomedical Engineering, Virtual Conference, Sept 7-9, 2021.
 31. **Erin Louwagie**, Lindsey Carlson, Joy Vink, Timothy Hall, Helen Feltovich, and Kristin Myers, "The Mechanical Loading of the Human Uterus and Cervix in Pregnancy Based on Ultrasound-derived Finite Element Models", Oral Presentation, U.S. National Congress on Computational Mechanics, Virtual Conference, July 25-29, 2021.

32. **Erin Louwagie**, Mirella Mourad, Chia-Ling Nhan-Chang, Joy Vink, Ronald Wapner, and Kristin Myers, "Biomechanics of Cervical Funneling in High-risk Pregnancies", Oral Presentation, European Society of Biomechanics, Virtual Conference, July 25-29, 2021.
33. **Erin M. Louwagie**, Lindsey C. Carlson, Joy Y. Vink, Timothy J. Hall, Helen M. Feltovich, Kristin M. Myers, "Effects of Maternal Geometry and Gestational Age on Loading of the Gravid Human Uterus and Cervix", Oral Presentation, Summer Biomechanics, Bioengineering and Biotransport Conference, Virtual Conference, June 14-18, 2021.
34. Arielle D. Feder, **Erin M. Louwagie**, Joy Y. Vink, Kristin M. Myers, "Parametric Patient-Specific Models Simulation Human Cervix Deformation During the First Stage of Labor", Poster Presentation, Summer Biomechanics, Bioengineering and Biotransport Conference, Virtual Conference, June 14-18, 2021. (*Runner-up in BS level Student Paper Competition in Soft Tissues*)
35. Christopher Z. Mosher, Hannah R. Childs, Elisa C. Fang, Jessica Z. Liu, Yizhong Jenny Hu, **Erin M. Louwagie**, Roshan P. Shah, X. Edward Guo, Stephen B. Doty, Kristin M. Myers, and Helen H. Lu, "Osteoarthritis Disrupts Interdigitation And Mechanical Function Of The Human Osteochondral Interface", Oral Presentation, Orthopaedic Research Society 2021 Annual Meeting, February 12-16, 2021. [Available: <https://www.ors.org/Transactions/67/61.pdf>]
36. **Erin Louwagie**, Veronica Over, Lindsey Carlson, Joy Vink, Timothy Hall, Helen M. Feltovich, Kristin Myers, "Patient-Specific Parametric Models of the Gravid Uterus and Cervix from 2D Ultrasound", Oral Presentation, Summer Biomechanics, Bioengineering and Biotransport Conference, Virtual Conference, June 17-20, 2020.
37. **Erin Louwagie**, Lei Shi, Andrea Westervelt, Mirella Mourad, Chia-Ling Nhan-Chang, Joy Vink, Kristin Myers, "Biomechanics of Cervical Funneling in High-Risk Pregnancies", Poster Presentation, NIH Interagency Modeling and Analysis Group - Amplifying Impact by Nurturing Diversity Futures Meeting, Virtual Conference, March 17, 2020. [Available: <https://www.imagwiki.nih.gov/current-imag-meeting/attendee-information-and-presentations>] (*Trainee Poster Competition Honorable Mention*)
38. Andrea Westervelt, Mirella Mourad, **Erin Louwagie**, Joy Vink, Kristin Myers, "Computational Models of Human Pregnancy from a Cohort of Patients at High Risk for Preterm Birth", Oral Presentation, 19th International Symposium on Computer Methods in Biomechanics and Biomedical Engineering and 4th Conference on Imaging and Visualization, New York, NY, August 14-16, 2019.
39. **Erin Louwagie**, Yiru Wang, Daniel Larkin, David Boulware, John Bischof, "A Clinical Study: Thermal Contrast Amplification Reader Improves the Detection of Strep Throat for Lateral Flow Assays", Poster Presentation, Summer Biomechanics, Bioengineering and Biotransport Conference, Tucson, AZ, June 21-24, 2017. (*Third Place in BS level Student Paper Competition in Human Dynamics and Injury, Devices, and Imaging*)

INVITED PRESENTATIONS

1. Computational Approaches to Study Pregnancy Biomechanics, Erin Louwagie. Department of Biomedical Engineering, Wayne State University (departmental seminar), Detroit, MI, April 9, 2025.

MEMBERSHIP AND SERVICE

- **Organizer** (July 13, 2026), World Congress of Biomechanics Workshop, "Women's Health Biomechanics: The Engineering Perspective", *Over 150 attendees, standing room only*
- **Organizer** (June 23, 2025), SBC2025 Workshop, "Women's Health and Engineering"
- **Presenter** (April 2023), Columbia University Society of Women Engineers (SWE) Engineering Exploration Experience
- **Presenter** (March 2021), WISC STEMinars: How engineers are closing the medical health gap

[Available: <https://www.youtube.com/watch?v=F6vvaE9v43w&t=17s>]

- **Treasurer** (2019-2021), **Member** (2018-2024) Columbia University Mechanical Engineering Graduate Association (MEGA)
- **Volunteer** (2019-2024), Columbia University STEM Starters
- **Workshop Leader** (Feb 2020), Columbia University Society of Women Engineers (CU SWE) Engineering Exploration Experience
- **Volunteer** (2019), Women in Science at Columbia (WISC) Girls Science Day
- **Mentor** (2018-2019), Read Ahead
- **Team Tech Director** (2017-2018), **Mentor** (2017-2018), **Team Tech Solar Vehicle Project Director** (2016-2017), **Member** (2015-2018), University of Minnesota - Twin Cities Society of Women Engineers (SWE UMN)

TECHNICAL SKILLS

- **Software:** FEBio suite, HyperWorks Suite, SolidWorks, MATLAB, ImageJ, ITK-SNAP, Python
- **Clinical:** Study design and implementation for IRB and HIPAA compliance, Consenting research participants, REDCap design and usage
- **Fabrication:** 3D printing, Laser cutting, Soldering, Circuit design, Hand tools
- **Laboratory:** Lab safety management