

TEXAS STATE VITA**I. Academic/Professional Background****A. Name and Title**

Name: Dr. Young Ju Lee

Title: Professor

B. Educational Background

<i>Degree</i>	<i>Year</i>	<i>University</i>	<i>Major</i>	<i>Thesis/Dissertation</i>
PHD	2004	Penn State University Park	Mathematics	
BS	1998	Chung-Ang University	Mathematics	

D. Relevant Professional Experience

<i>Position</i>	<i>Entity</i>	<i>Comments</i>	<i>Dates</i>
Associate Professor	Mathematics, Kunsan National University, Kunsan, South Korea	This work was related to my Brainpool Fellowship from National Research Foundation of Korea. I was at sabbatical leave from July/1/2020 to June/30/2021.	July 1, 2020 - June 30, 2021
Assistant Professor	Mathematics, Rutgers, The State University of New Jersey, New Jersey, NJ		July 1, 2007 - June 30, 2013
Assistant Adjunct Professor and Assistant Researcher	Mathematics, UCLA, Los Angeles, CA		July 1, 2004 - June 1, 2007

II. TEACHING**A. Teaching Honors and Awards:**

Award / Honor Recipient: Teaching Award of Honor, Texas State Alumni Association.
May 2020

Award / Honor Recipient: Teaching and Learning Technology Innovation Grant
Opportunity for Full-Time Faculty, Texas State University.

June 1, 2016 - May 30, 2017

B. Courses Taught:

Texas State University:

MATH 2321 - CALCULUS FOR LIFE SCIENCES I

MATH 2471 - CALCULUS I

MATH 2472 - CALCULUS II

MATH 3323 - DIFFEREN EQUAT

MATH 3373 - CALCULUS III

MATH 3380 - ANALYSIS I

MATH 3383 - NUM ANALYSIS I

MATH 3383 - NUMERICAL ANALYSIS I

MATH 4306 - FOURIER SERIES

MATH 4336 - STUDIES APPL MATH

MATH 4337C - NUMERICAL METHODS FOR ODES

MATH 4383 - NUM ANALYSIS II

MATH 4383 - NUMERICAL ANALYSIS II

MATH 5199B - THESIS

MATH 5299B - THESIS

MATH 5317 - PROB ADV MATH

MATH 5336 - STUDIES APP MATH

MATH 5336 - STUDIES IN APPLIED MATH

MATH 5340 - SCIENTFC COMPUTATN

MATH 5340 - SCIENTIFIC COMPUTATION

MATH 5382 - REAL ANALYSIS

MATH 5393 - NUM OPTIMIZATION

MATH 5399A - THESIS

MATH 5399B - THESIS

MATH 7386 - INDPNT STDY MTH ED

Jilin University :

Finite Element Methods for Engineering Problems Based on Python and FEniCS

Kunsan National University:

Finite Element Methods for Engineering Problems using Python and FEniCS

Pennsylvania State University:

Calculus of Several Variables

College Algebra

Finite Mathematics

Linear Algebra

Ordinary and Partial Differential Equations

Plane Trigonometry

Rutgers, The State University of New Jersey:

Calculus

Mathematical Theory of Probability

Numerical Analysis III

Numerical Analysis II

Numerical Analysis I

UCLA:

Applied Numerical Analysis

Calculus

Mathematical Aspect of Scientific Computation

Ordinary Differential Equations

C. Directed Student Learning (i.e. theses, dissertations, exit committees, etc.):

Supervisor / Chair, Applied Research Project, "K-Mean and Fast Solver", Status: In Progress. (November 2023 - Present). Mathematics.

Student(s): Emily Whitson, Undergraduate, Undergraduate.

Supervisor / Chair, Applied Research Project, "A fast solver for Support Vector Machine", Status: In Progress. (October 2023 - Present). Mathematics.

Student(s): Samuel Tyminski, Undergraduate, Undergraduate.

Additional Comments: This student is currently working with me.

Supervisor / Chair, Applied Research Project, "A fast solver for Logistic regression", Status: In Progress. (January 1, 2022 - Present). Mathematics, Texas State University.

Student(s): Jialong Li, Undergraduate, Master.

Additional Comments: Jialong started to work with me in the Spring of 2022 as an undergraduate student. He is admitted to Master program and he will work with me continuously for designing a fast solver for Logistic regression.

Supervisor / Chair, Applied Research Project, "Quantum Computing and Numerical Analysis", Status: Completed. (September 2023 - December 2023).

Student(s): Cameron Sponge, Undergraduate, Undergraduate.

Additional Comments: This Student was supported by REU supplemental grant award from my NSF grant fully for a semester (\$3200).

Supervisor / Chair, Master's Thesis, "Modeling and simulation of the hyperelasticity of elastomers", Status: Completed. (September 20, 2019 - May 1, 2021). Mathematics, Texas State University.

Student(s): Kyle Wiancki, Graduate, Master of Applied Mathematics.

Additional Comments: Kyle is currently working as Flight Dynamics Engineer II at SpaceNav and he did an internship at NASA Langley Research Center in the summer of 2020.

Member, Dissertation, "Modeling and Experiments of Wormlike Micellar Fluids", Status: Completed. (January 1, 2017 - August 1, 2020). Materials Science, Engineering and Commercialization, Texas State University.

Student(s): Emad Jafari, Doctoral, Ph.D.

Supervisor / Chair, Applied Research Project, "Fast Solver for Poisson's Equation with Pure Neumann Conditions", Status: Completed. (September 1, 2018 - August 1, 2019). Mathematics, Texas State University.

Student(s): Garrett Faber, Undergraduate, B.A.

Supervisor / Chair, Applied Research Project, "Modeling and Simulation of WMF for Oil Recovery", Status: Completed. (June 20, 2018 - July 30, 2018). Mathematics, Texas State University.

Student(s): Michael Li.
Sydney Zhou.
Pierce Lai.

Additional Comments: The project is performed in relation of MathWorks program directed by Prof. M. Washauer

Supervisor / Chair, Master's Thesis, "Fast solver for expanded mixed finite element methods", Status: Completed. (June 1, 2017 - May 1, 2018). Mathematics, Texas State University.

Student(s): Robert Salit, Graduate, Master.

[SALIT-THESIS-2018-1.pdf](#)

Additional Comments: Robert Salit completed his master thesis entitled "A Fast Solver for Discrete Systems arising from the Expanded Finite Element Method". Robert went onto take a job as Data Analyst for Trinity Healthcare Resources.

Member, Dissertation, "Tig Welding Skill Extraction Using a Machine Learning Algorithm", Status: Completed. (August 1, 2015 - December 2017). Engineering, Texas State University.

Student(s): Shelby Huff, Doctoral, Ph.D.

Additional Comments: I have participated for Huff's thesis work as a Ph.D. committee.

Supervisor / Chair, Applied Research Project, "Enhancing Oil Recovery via Wormlike Micellar Fluids", Status: Completed. (July 1, 2017 - September 20, 2017). Mathematics, Texas State University.

Student(s): Ethan Nolen.

Supervisor / Chair, Applied Research Project, "Enhancing Oil Recovery via Wormlike Micellar Fluids", Status: Completed. (June 1, 2017 - September 20, 2017). Mathematics, Texas State University.

Student(s): Jonathan Shoemaker.

Additional Comments: Jonathan was a MathWorks student. His work was placed on semi-finalist of Siemens competition.

Supervisor / Chair, Master's Thesis, "Numerical Analysis of Shortley-Weller Formula for Non Uniform Interior grids.", Status: Completed. (January 20, 2016 - May 30, 2017). Mathematics, Texas State University.

Student(s): Richard Clancy, Graduate, Master.

Additional Comments: Richard Clancy went onto University of Colorado at Boulder to pursue his Ph.D. degree in applied mathematics starting at the fall of 2017.

Supervisor / Chair, Project, "Two Grid Methods for Neumann Problems", Status: Completed. (2016).
Student(s): Michelle Kim.

Supervisor / Chair, Project, "Wormlike Micellar Fluids and EOR", Status: Completed. (2015).
Student(s): Peter Gu.

Research Supervisor, Project, "Boundary Conditions for Diffusive Non-Newtonian Fluids Flows", Status: Completed. (October 1, 2013 - December 30, 2015). Mathematics, Texas State University.
Student(s): Christina Starkey, Doctoral, Ph.D.

Additional Comments: Christina and I published a SCI-journal paper in 2018.

Supervisor / Chair, Project, "Two Grid Methods for Singular Problems", Status: Completed. (2014).
Student(s): Hans Li.

Member, Dissertation, "Efficient Domain Decomposition Algorithms for the Solution of the Helmholtz Equation", Status: Completed. (August 1, 2010 - August 1, 2014). Mathematics, New Jersey Institute of Technology.
Student(s): Dawid Midura, Doctoral, Ph.D.

Additional Comments: I have participated in the thesis of Dawid as a Ph.D. committee.

D. Courses Prepared and Curriculum Development:

Numerical Methods for Partial Differential Equations with FEniCS and Python, Curriculum Development, Jilin University. Taught: July 2021 - August 2021.

Numerical Methods for Partial Differential Equations with FEniCS and Python, Curriculum Development, Kunsan National University. Taught: January 2021.

[kunsan-ku page 1-1.pdf](#)

Additional Comments: This course is delivered in only 4 days. But, I have taught total of 4 hours each day, so, total 16 hours.

Scientific Computing, Curriculum Development, Texas State University. Taught: January 2017 - May 2017.

Additional Comments: I have completed new course materials for the course on Scientific Computing. This includes, finite element method and discontinuous Galerkin finite element method.

Mathematical Aspect of Scientific Computation, Curriculum Development, UCLA.
Taught: September 2003 - December 2003.

Numerical Method for Ordinary Differential Equations, New Course, Texas State
University. Approved: September 2018 - Present.

[syllabus-NMODE-1.pdf](#)

Math Courses in New Civil Engineering program, New Degree Program, Texas State
University. Approved: January 2017 - May 2017.

Additional Comments: I have contributed to generate Finite Element Course for
the new Civil Engineering program.

F. Other:

Guest Lecture, Applied Mathematics at Jilin University, China. China. 15. (July 2021 -
August 2021).

[2021YoungJuLee-1.pdf](#)

Guest Lecture, Kunsan National University. Kunsan, South Korea. 10. (March 1, 2021 -
March 7, 2021).

[kunsan-ku-1.pdf](#)

Additional Comments: While I was at Kunsan National University, I gave a
lecture on FEM with FEniCS.

Student Accomplishments:

Grant:

Supervisor, Graduate Student Travel Grant. "A Fast Solver for Logistic
Regression," CBMS Conference: Deep Learning and Numerical PDEs,
Baltimore, Maryland, USA. Status: In Progress. (June 2023).
Mathematics.

Student(s): Jialong Li, Graduate, Master Degree.

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Additional Comments: Jialong obtained a total of \$1375 from Department
and Graduate College for travel grant.

Supervisor, The Rising STAR Travel Grant. "A Fast Solver for Logistic
Regression," CBMS Conference: Deep Learning and Numerical PDEs,
Baltimore, Maryland, USA. Status: In Progress. (June 2023).
Mathematics.

Student(s): Jialong Li, Graduate, Master Degree.

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Additional Comments: Jialong Li presented his talk, entitled "A Fast
Solver for Logistic Regression" at the conference.

NASA Internship :

Mentor. Virginia. Status: Completed. (June 2020). Mathematics, Texas State University.

Student(s): Kyle Wiannecki, Graduate, Master.

Performance:

Supervisor, Modeling and Simulation of Wormlike Micellar Fluids.

"Modeling and Simulation of Wormlike Micellar Fluids," Siemens competition. Status: Completed. (September 2017). Mathematics, Texas State University.

Student(s): Jonathan Shoemaker.
Ethan Nolen.

Additional Comments: Jonathan and Ethan made the semi-finals of the Siemens competition.

Presentation:

Supervisor, Student presentation at CBMS Conference: Deep Learning and Numerical PDEs. "A Fast Solver for Logistic Regression," CBMS Conference: Deep Learning and Numerical PDEs, Baltimore, Maryland, USA. Status: In Progress. (June 2023). Mathematics.

Student(s): Jialong Li, Graduate, Master Degree.

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Published Work:

Mentor, A new boundary condition for rate-type non-Newtonian diffusive models and the stable MAC scheme. "A new boundary condition for rate-type non-Newtonian diffusive models and the stable MAC scheme.." Status: Completed. (August 2015). Mathematics, Texas State University.

Student(s): Christina Starkey, Doctoral, Ph.D.

[JCM2015-0359-1.pdf](#)

Travel Support:

Mentor. (February 2019).

Student(s): Alina Rajbhandari.

III. SCHOLARLY/CREATIVE

A. Works in Print (including works accepted, forthcoming, in press):

2. Articles:

a. Refereed Journal Articles:

- Li, Z., Jia, J., Liao, G., Lee, Y. J., & Liu, S. (2023). Neural network method and multiscale modeling of the COVID-19 epidemic in Korea. *The European Physical Journal Plus*. Published.
[32a4e244-2470-4315-ac92-a4190cdbe4be-1.pdf](#)
- Choi, Y., Jo, G., Kwak, D., & Lee, Y. J. (2022). Locally conservative discontinuous bubble scheme for Darcy flow and its application to Hele-Shaw equation based on structured grid. *Numerical Algorithms*, 1–26.
[DB{EIFEM_revision-2.pdf](#)
- Jaracz, J. S., & Lee, Y. J. (2022). Existence and Stability of Global Solutions to a regularized Oldroyd-B Model in its Vorticity Formulation. *Journal of Differential Equations*, 327, 259–321.
[2111.12030-1.pdf](#)
- Jo, G., Lee, Y. J., & Ojeda-Ruiz, I. (2022). 2D and 3D image reconstruction from slice data based on a constrained bilateral smoothing and dynamic mode decomposition. *Applied Mathematics and Computation*. Published.
- Kim, S., Kim, M., Lee, S., & Lee, Y. J. (2021). Discovering spatiotemporal patterns of COVID-19 pandemic in South Korea. *Scientific Reports*, 11. Published.
[DMD_COVID-1.pdf](#)
- Jafari, E., Lee, Y. J., Lee, G.-H., & Kim, N. (2021). Quasi-Static Secondary Flow Regions Formed by Microfluidic Contraction Flows of CTAB/NaSal Wormlike Micellar Solutions. *Physics of Fluids*, 33(9).
- Lee, Y. J., & Li, H. (Published). The Macroelement Analysis for Axisymmetric Stokes Equations. *Computers and Mathematics with Applications*.
- Jafari, E., Lee, Y. J., Na, H. J., You, B. H., Lee, M. Y., & Kim, N. (2021). Effects of NaCl and Temperature on Rheological Characteristics and Structures of CTAB/NaSal Wormlike Micellar Solutions. *Journal of Industrial and Engineering Chemistry*, 98, 458–464.
- Hu, K., Lee, Y. J., & Xu, J. (Published). Helicity conservative finite element discretizations for MHD systems. *Journal of Computational Physics*.

Additional Comments: This is resubmitted after revision on Jan/2021.

- Jo, G., Kwak, D., & Lee, Y. J. (Published). Locally conservative enriched immersed finite element method (EIFEM) for elliptic interface problems with a fast solver. *Journal of Scientific Computing*. Retrieved from Texas State University, San Marcos, TX 78666 **Error! Hyperlink reference not valid.**

[IFEM_EG_20200110-1.pdf](#)

Additional Comments: This is revised and resubmitted on Jan, 2021

Jia, J., Lee, Y. J., Feng, Y., Wang, Z., & Zhao, Z. (2020). Hybridized Weak Galerkin Finite Element Methods for Brinkman Equations. *Electronic Research Archive*. Published.

Seo, J.-H., Tsuda, I., Lee, Y. J., Ikeda, A., Matsuhashi, M., Matsumoto, R., ... Kang, H. (2020). Pattern Recognition in Epileptic EEG Signals via Dynamic Mode Decomposition. *Mathematics*, 8(4).
[mathematics-08-00481-v2-1.pdf](#)

Odeja-Ruiz, I., & Lee, Y. J. (2020). A fast constrained image segmentation algorithm. *Results in Applied Mathematics*, 8. Published. Retrieved from 2450 Great Oaks Dr.
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[RINAM-S-19-00448-1.pdf](#)

Jafari Nodoushan, E., Yi, T., Lee, Y. J., & Kim, N. (2019). Wormlike Micellar Solutions, Beyond the Chemical Enhanced Oil Recovery Restrictions. *Fluids*, 4. Published.

Li, K., Lee, Y. J., & Starkey, C. (2018). A new boundary condition for rate-type non-Newtonian diffusive models and the stable MAC scheme. *Journal of Computational Mathematics*, 36, 605–626.
[JCM2015-0359-1.pdf](#)

Ku, J., Lee, Y. J., & Sheen, D. (2017). A hybrid two-step finite element method for flux approximation: a priori estimates. *ESIAM: Mathematical Modeling and Numerical Analysis*, 51, 1303 – 1316.

Jin, G., Lee, Y. J., & Li, H. (2017). Regularity estimates and optimal finite element methods. *Computers & Mathematics with Applications*, 74, 2089–2105.

Lee, Y. J., Leng, W., & Zhang, C. (2016). A stable and scalable hybrid solver for rate-type non-Newtonian fluid models. *Journal of Computational and Applied Mathematics*, 300. Published.

Lee, S., Lee, Y. J., & Wheeler, M. (2016). A Locally Conservative Enriched Galerkin Approximation and Efficient Solver for Elliptic and Parabolic Problems. *SIAM Journal on Scientific Computing*, 38(3).

Kang, H., & Lee, Y. J. (2016). A three-species model for wormlike micellar fluids. *Computers and Mathematics with Applications*, 71(7).

- Lee, Y. J. (2015). Analysis of Two Grid method for Solving Higher-Order Finite Element Methods. *Dynamics of Continuous, Discrete and Impulsive Systems, Series B: Applications and Algorithms*, 22. Published.
- Hu, X., Lee, Y. J., Xu, J., & Zhang, C. (2014). On Adaptive Eulerian–Lagrangian Method for Linear Convection–Diffusion Problems. *Journal of Scientific Computing*, 58(1).
- Lee, Y. J., & Li, H. (2012). Axisymmetric Stokes Equations in Polygonal Domains: Regularity and Finite Element Approximations. *Computers and Mathematics with Applications*, 64. Published.
- Niu, X., Lee, Y. J., Stringfellow, G., & Liu, F. (2012). Simulation of self-assembled compositional core-shell structures in InGaN nanowires. *Physical Review B*, 85. Published.
- Lee, Y. J., Xu, J., & Zhang, C. (2011). GLOBAL EXISTENCE, UNIQUENESS AND OPTIMAL SOLVERS OF DISCRETIZED VISCOELASTIC FLOW MODELS. *Mathematical Models and Methods in Applied Sciences*, 21. Published.
- Lee, Y. J., & Li, H. (2011). On Stability, Accuracy, and Fast Solvers for Finite Element Approximations of the Axisymmetric Stokes Problem by Hood–Taylor Elements. *SIAM Journal on Numerical Analysis*, 49(2).
- Lee, Y. J. (2009). Uniform stability analysis of Austin, Manteuffel and McCormick finite elements and fast and robust iterative methods for the Stokes-like equations. *Numerical Linear Algebra with Applications*. Published.
- Reich, J. M., Niu, X., Lee, Y. J., Caflisch, R. E., & Ratsch, C. (2009). Lateral alloy segregation in thin heteroepitaxial films. *Physical Review B*, 79. Published.
- Lee, Y. J., Wu, J., & Chen, J. (2009). Robust multigrid method for the planar linear elasticity problems. *Numerische Mathematik*, 113(3), 473–496.
- Wu, J., Lee, Y. J., Xu, J., & Zikatanov, L. (2008). CONVERGENCE ANALYSIS ON ITERATIVE METHODS FOR SEMIDEFINITE SYSTEMS. *Journal of Computational Mathematics*, 26, 797–815.
- Niu, X., Lee, Y. J., Caflisch, R. E., & Ratsch, C. (2008). Optimal Capping Layer Thickness for Stacked Quantum. *Physical Review Letters*, 101. Published.

Lee, Y. J., Wu, J., Xu, J., & Zikatanov, L. (2007). ROBUST SUBSPACE CORRECTION METHODS FOR NEARLY SINGULAR SYSTEMS. *Mathematical Models and Methods in Applied Sciences*, 17(11).

Lee, Y. J., Wu, J., Xu, J., & Zikatanov, L. (2007). A Sharp Convergence Estimate for the Method of Subspace Correction for Singular Systems. *Mathematics of Computation*, 77, 831–850.

Lee, Y. J., Wu, J., Xu, J., & Zikatanov, L. (2006). On the convergence of iterative methods for semidefinite linear systems. *SIAM Journal on Matrix Analysis and Applications*, 28(3), 634–644.

Lee, S., Caflisch, R. E., & Lee, Y. J. (2006). Exact Artificial Boundary Conditions for Continuum and Discrete Elasticity. *SIAM Journal on Applied Mathematics*, 66, 1749–1775.

Caflisch, R. E., Lee, Y. J., Shu, S., Xiao, Y.-X., & Xu, J. (2006). An application of multigrid methods for a discrete elastic model for epitaxial systems, 219(2), 697–714.

Lee, Y. J., & Xu, J. (2006). New Formulations, Positivity Preserving Discretizations and Stability Analysis for non-Newtonian Flow models. *Computer Methods in Applied Mechanics and Engineering*, 195, 1180–1206.

5. Reports:

Huh, S., Lee, Y. J., Gornowicz, G., & Henderson, R. D. (2014). *Fast and Robust Continuous Collision Detection (fastCCD)*. United States. Retrieved from 2450 Great Oaks Drive **Error! Hyperlink reference not valid.**

B. Works Not in Print:

1. Papers Presented at Professional Meetings:

Lee, Y. J., Finite Element Circus, "The Macroelement Analysis of Axisymmetric Stokes Equations," Pennsylvania State University, State College, PA, United States. (November 7, 2021).

2. Invited Talks, Lectures, and Presentations:

Lee, Y. J., Applied Mathematics Seminar at Pukyong National University, "Introduction to Machine Learning through Logistic Regression," Pukyong National University. (January 10, 2024).

Lee, Y. J., Applied Mathematics Seminar in Jilin University, "An efficient flux-variable approximation scheme for Darcy Law model.," Changchun. (December 6, 2023).
[Screenshot 2024-01-28 at 3.47.06 PM-1.png](#)

Lee, Y. J., Colloquium, "Multiscale Image Segmentation," KAUST, Jeddah, Saudi Arabia. (October 11, 2022).

Lee, Y. J., International Multigrid Conference (IMG 2022), "Fast solver for the Logistic equation," Università della Svizzera italiana, Lugano, Switzerland. (August 22, 2022).
[Scientific Program-1.pdf](#)

Lee, Y. J., Conference in honor of Jinchao's 40 years of research in mathematics,
"Helicity-conservative finite element discretization for incompressible
MHD-equations," Pennsylvania State University, State College, PA, United States.
(November 5, 2021).
[Conference in honor of Jinchao's 40 years of research in mathematics -1.pdf](#)

Lee, Y. J., KSIAM Annual Meeting, "Helicity Preserving Finite Element Methods for MHDs," Jeju, South Korea. (November 2020).

Lee, Y. J., "Research related to understanding image data," Yongin, South Korea. (November 17, 2020).

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Lee, Y. J., "Research related to understanding image data," Dong-A University, Medical Department, Busan, South Korea. (September 2020).

Jafari Nodoushan, E., Yi, T., Lee, Y. J., Kim, N., ASME International Mechanical Engineering Congress & Exposition (IMECE2019), "Flow Induced Structures and Instabilities of Viscoelastic Wormlike Micellar Solutions," American Society of Mechanical Engineers, Salt Lake, UT, United States. (November 2019).

Lee, Y. J. (Speaker), CCMA 2019, Las Vegas, NV. (October 25, 2019).
[CCMA2019AbstractTemplate-1.pdf](#)

Lee, Y. J., "Helicity Preserving Finite Element for Magnetohydrodynamics Equations," Kunming, China. (August 2019).

Lee, Y. J., "Dynamic Mode Decomposition and its potential use to analyze patterns of ictal and interictal EEG data," Busan, South Korea. (August 21, 2019).
[K2Web Wizard-1.pdf](#)

- Lee, Y. J., American Mathematical Society, "Locally mass preserving finite elements for axisymmetric Stokes equation," Baltimore, MD. (January 2019).
- Lee, Y. J., USNCCM 14, "Macroelement Techniques for Axisymmetric Stokes Equations," Montreal, Canada. (2017).
- Lee, Y. J., CSM Affiliate Meeting, "Enriched Galerkin Finite Element Method for Coupled Flow and Transport in Porous Media," UT Austin. (November 2, 2016).
- Lee, Y. J. (Speaker), KSA Workshop, "A Three-Species Model for Wormlike Micellar Fluids," Austin, TX, United States. (January 2016).
- Lee, Y. J., Advanced Numerical Reservoir Simulations, "Multigrid Methods for Linear Elasticity with weakly imposed symmetry," NIMS. (October 2015).
- Lee, Y. J., LSEC Colloquium, "Enriched Galerkin Finite element methods for Darcy Law and its Applications to EOR," Chinese Academy of Science. (May 2015).
- Lee, Y. J., RAACM, "Non-Local Three Species Model for Wormlike Micellar Fluids." (May 28, 2015).
- Lee, Y. J., Colloquium, "Non-local three-species model for wormlike micellar fluids," Idaho State University. (March 2015).
- Lee, Y. J., SIAM Workshop on Dimension Reduction, "Non-Local Three Species Model for Wormlike Micellar Fluids." (March 21, 2015).
- Lee, Y. J., SIAM Mini-Symposium, "Multigrid Methods for Linear Elasticity with Weakly Imposed Symmetry." (March 13, 2015).
- Lee, Y. J., Colloquium, "Non-local three-species model for wormlike micellar fluids," NJIT. (February 2015).
- Lee, Y. J., SCPDE 2014 on the Occasion of Eitan Tadmor's 60th birthday, "Fast time marching methods for convection-diffusion equations," HUST. (December 8, 2014).
- Lee, Y. J., Colloquium, "Self-sustaining oscillations of the falling ball through Johnson-Segalman fluids," UT El paso. (September 2014).
- Lee, Y. J., Robust Discretization and Fast Solvers for Computable Multi-Physics Models, "Stable Discretization of non-Newtonian Flows," ICERM Brown. (May 2014).
- Lee, Y. J., Kunming-China Workshop, "A Scalable Auxiliary Space Preconditioner for High-Order Finite Element Methods." (August 7, 2013).
- Lee, Y. J., CFD Seminar, "Modeling and Simulation of non-Newtonian Fluids Flows," NIA. (August 2012).

- Lee, Y. J., Colloquium, "Modeling and Simulation of non-Newtonian Fluids Flows," University of Ulsan. (May 2012).
- Lee, Y. J., Colloquium, "Modeling and Simulation of non-Newtonian Fluids Flows," Seoul National University. (May 2012).
- Lee, Y. J., "An Application of Multigrid Methods for the Simulation of Non-Newtonian Fluid Flows," Brown University. (March 2012).
- Lee, Y. J., Colloquium, "An Application of Multigrid Methods for the Simulation of non-Newtonian Fluid Flows," Wayne State University. (February 2012).
- Lee, Y. J., PDE Workshop, "Special Lecture on non-Newtonian Fluids Computations," at Chung-Ang University, South Korea. (August 2011).
- Lee, Y. J., 11th US National Congress on Computational Mechanics, "On the boundary conditions for the diffusive viscoelastic fluid models," University of Minnesota. (July 2011).
- Lee, Y. J., Graduate Alumni Conference, "Memory of My Time at Penn State and Now," Penn State. (April 2011).
- Lee, Y. J., 16th International Conference on Finite Elements in Flow Problems, "On the boundary conditions for the diffusive viscoelastic fluid models," Germany. (March 2011).
- Lee, Y. J., Colloquium, "Self-Sustaining Oscillations of the Falling Sphere through the Johnson-Segalman fluids," Rutgers University. (October 2010).
- Lee, Y. J., Colloquium, "Self-Sustaining Oscillations of the Falling Sphere through the Johnson-Segalman fluids," LSU. (October 2010).
- Lee, Y. J., The XVII International Workshop for Numerical Method for non-Newtonian Fluids Mechanics, "Self-Sustaining Oscillations of the Falling Sphere through the Johnson-Segalman fluids," University of Mass, Amherst. (June 2010).
- Lee, Y. J., IMA-PIP Workshops on Numerical Modeling of Complex Fluids and MHD, "Self-Sustaining Oscillations of the Falling Sphere through the Johnson-Segalman fluids," Penn State. (March 2010).
- Lee, Y. J., American Mathematical Society, "Fast and Robust Multigrid Methods for Stokes-Like Equations," Indiana University. (April 2008).
- Lee, Y. J., 8th IMACS International Symposium on Iterative Methods in Scientific Computation, "Fast solution method for discrete elastic strain models." (November 2006).
- Lee, Y. J., The 6th International Conference on Computational and Mathematical Methods in Science and Engineering, "Convergence Theories of Subspace Correction

Methods for Singular System of Equations and their applications," Spain. (September 2006).

Lee, Y. J., The 17th International Conference on Domain Decomposition Methods, "Convergence Theories of Subspace Correction Methods for Singular System of Equations and their applications," Austria. (July 3, 2006).

Lee, Y. J., Computational Methods in Multiscale Analysis and Applications, "New numerical techniques for non-Newtonian fluids models," University of Florida. (March 2005).

3. Consultancies:

Academic, University of Texas at Austin, Austin, TX, United States. (June 1, 2014 - August 1, 2018).

Additional Comments: I have worked with Prof. Mary Wheeler on enriched Galerkin finite element methods.

5. Other Works not in Print:

b. Works "in progress":

Journal Articles:

Kim, I., Ku, J., Lee, Y. J., & Sheen, D. (In Preparation; Not Yet Submitted). A simple approximation scheme for Darcy's law.

c. Other Works Not in Print:

Posters:

Jafari Nodoushan, E., Lee, Y. J., Kim, N., 2019 WiSE Conference, "Temperature and Salinity Effects on Rheological Characteristics of Wormlike Micellar Solutions," Texas State University, San Marcos, United States. (March 2019).

C. Scholarly / Creative Grants and Contracts:

1. Funded External Grants and Contracts:

Lee, Young Ju. Coupled Flow and Transport Modeling and Simulation of Complex Fluids and Extreme Weather Patterns by Harnessing Data, NSF, Federal, \$350,017.00. (Funded: June 1, 2022 - May 31, 2025). Grant.

Kim, Namwon (Principal), Lee, Young Ju (Co-Principal). Computational and Experimental Investigations of Wormlike Micellar Fluids for Enhanced Oil

Recovery, American Chemical Society (ACS) Petroleum Research Fund (PRF), Other, \$110,000.00. (Funded: December 1, 2016 - August 31, 2021). Grant.

Lee, Young Ju. A development of enriched immersed finite element method for computing multiphase flows in porous media, National Research Foundation of Korea, Institutional (Higher Ed), \$120,000.00. (Funded: July 2020 - June 2021). Grant.

Lee, Young Ju. Modeling and Simulations of Complex Fluids and Atomistic Strain, NSF, Federal, \$144,816.00. (Funded: July 2013 - August 2018). Grant.

Lee, Young Ju. Novel Numerical Techniques for Complex Fluids Modeling, NSF, \$144,795.00. (Funded: June 2009 - July 2013). Grant.

Lee, Young Ju. New numerical techniques for non-Newtonian flow simulations and their application to modelling of complex flows, NSF, Federal, \$97,708.00. (Funded: June 2006 - June 2009). Grant.

2. Submitted, but not Funded, External Grants and Contracts:

Lee, Young Ju (Principal), Percent Contribution: 100%. Integrated Studies of Coupled Flow and Transports by Physical Experiments, Mathematical Modeling and Numerical Simulations based on Novel Schemes, Federal, \$291,538.00. (Submitted: December 1, 2019, Funded: June 1, 2020 - May 31, 2023). Grant.

[Application_Lee-1.pdf](#)

Lee, Young Ju. Mathematical modeling by physical experiments and conservative numerical simulation of complex fluids, and its applications, NSF, Federal, \$342,297.00. (Submitted: December 1, 2018, Funded: July 2019 - August 2022). Grant.

Lee, Young Ju, Ojeda-Ruiz, Ivan. NRT-HDR (Track2): Harnessing Data to Design Predictive Brain Disease and Extreme Weather Patterns, NSF, Federal, \$1,167,214.00. (Funded: March 1, 2022 - Present). Grant.

Lee, Young Ju. Coupled Flow and Transports Modeling and Simulation of Complex Fluids and Extreme Weather Patterns by Harnessing Data, NSF, Federal, \$428,971.00. (Submitted: December 2021). Grant.

Lee, Young Ju. Collaborative Research: Integrated Studies of Coupled Flow and Transports, NSF, Federal, \$297,974.00. (Submitted: December 2020). Grant.

Lee, Young Ju, Li, Yukun (Co-Principal). Collaborative Research: Integrated Studies of Coupled Flow and Transports by Mathematical Modeling, Novel and Stable Algorithms and Numerical Simulations, NSF, Federal, \$297,974.00. (Submitted: December 2020). Grant.

Kim, Namwon (Principal), Lee, Young Ju (Co-Principal). Microscale Fluid Dynamics of Droplets and Shear Thickening Fluids, NSF, Federal, \$298,280.00. (Submitted: 2018). Grant.

Lee, Young Ju. Conservative Numerical Schemes and its Applications., NSF, Federal, \$306,727.00. (Submitted: December 1, 2017). Grant.

3. Funded Internal Grants and Contracts:

Lee, Chul-Ho (Principal), Lee, Young Ju (Co-Principal). Scalable and Efficient Fair Graph Clustering, Texas State Center for Analytics and Data Science (TXST CADS), Texas State University, \$6,000.00. (Submitted: December 2023, Funded: January 2024 - December 2024). Grant.

Lee, Young Ju. REP: Modeling and Simulation of Extreme Micro-Weather Patterns in Vapor-to-Particle Reaction, Convection and Diffusion Systems, Texas State University, Texas State University, \$8,000.00. (Funded: January 2022 - December 2022). Grant.

Theodoropoulou, Nikoleta (Co-Principal), Percent Contribution: 20%, Schemmel, John (Co-Principal), Percent Contribution: 20%, Ameri, Farhad (Principal), Percent Contribution: 20%, Lee, Young Ju (Co-Principal), Percent Contribution: 20%, Ojeda-Ruiz, Ivan (Co-Principal), Percent Contribution: 20%. Technology Enhanced Analysis of Materials, CoSearch 2019 - Materials with Intelligence, Texas State University, \$10,000.00. (Submitted: March 3, 2019, Funded: September 2019 - September 2020). Grant.

Theodoropoulou, Nikoleta (Co-Principal), Percent Contribution: 20%, Schemmel, John (Co-Principal), Percent Contribution: 20%, Ameri, Farhad (Principal), Percent Contribution: 20%, Lee, Young Ju (Co-Principal), Percent Contribution: 20%, Ojeda-Ruiz, Ivan (Co-Principal), Percent Contribution: 20%. Technology Enhanced Analysis of Materials, CoSearch 2019 - Materials with Intelligence, Texas State University, \$2,000.00. (Submitted: March 3, 2019, Funded: September 2019). Grant.

Lee, Young Ju. Research Enhancement Program, \$8,000.00. (Funded: January 2016 - December 2016). Sponsored Research.

4. Submitted, but not Funded, Internal Grants and Contracts:

Song, In-Hyounk (Co-Principal), Lee, Young Ju (Principal), You, Byoung Hee (Co-Principal). MIRG: Integrating Experiments, Physical Modeling and Computational Simulations for Extreme Micro-Weather Patterns in Vapor-to-Particle Reaction, Convection, and Diffusion Systems, Texas State University, \$25,000.00. (Funded: September 1, 2019 - August 31, 2020). Grant.

D. Scholarly / Creative Fellowships, Awards, Honors:

Award / Honor Recipient: Research Excellence Award, Mathematics Department.
December 2023 - Present

Award / Honor Recipient: National Science Foundation, National Science Foundation.
June 2022 - May 2025

July 1, 2013 - June 30, 2017

July 1, 2009 - June 30, 2013

July 1, 2006 - June 30, 2009

Fellowship Recipient: Shapiro Visiting Professorship in Penn State., Pennsylvania State University.

March 2022 - May 2022

[Letter of invitation-1.pdf](#)

Additional Comments: I have served as a Shapiro fellow at Penn State in Spring of 2022. My host was Professor Jinchao Xu.

Fellowship Recipient: Brain Pool Program : National Research Foundation of Korea, National Research Foundation of Korea.

July 1, 2020 - June 30, 2021

[bp-1.jpeg](#)

Additional Comments: This BP program matches my yearly salary while I am serving in Korea. The amount of award is identical with my yearly earnings in the year of 2019.

Fellowship Recipient: Jilin Visiting Professorship, Jilin University.

July 1, 2020 - June 30, 2021

[YoungJu-invitation-1.pdf](#)

Additional Comments: The contract attached is temporary. They are making an official one and that will be used for my work visa application. This position does not require any duty. I have declined this offer due to an offer from Korea Brain Pool fellowship.

Award / Honor Recipient: American Chemical Society, American Chemical Society.

January 1, 2017 - August 30, 2019

E. Scholarly / Creative Professional Development Activities Attended:

Workshop, "Tensor Methods," IPAM, UCLA, Los Angeles, CA, United States. (March 2021 - June 2021).

Additional Comments: I am selected as a core participant.

Institute, "Core Participant for Long-Term Program," UCLA, Los Angeles, CA, United States. (September 1, 2012 - December 15, 2012).

Institute, "Long Term Visitor," University of Minnesota, Minneapolis, MN, United States. (September 1, 2009 - December 15, 2009).

IV. SERVICE

A. Institutional

1. University:

Member, Academic Governance Committee. (June 8, 2017 - May 2020).
[Academic Governance Committee-1.pdf](#)

Member, REP Review Committee. (September 2017 - December 2017).

Additional Comments: I have reviewed total 42 proposals submitted for Research Enhancement Program.

2. College:

Participant, New Course Development for Civil Engineering. (January 2017 - May 2017).

Additional Comments: I have contributed to create curriculum for finite element course for new CE program.

3. Department/School:

Member, Curriculum Committee. (August 2021 - Present).

Chair of Graduate Teaching Assistantships, Texas State University. (August 2018 - June 2020).

Member, Colloquium. (August 2014 - January 2019).

Member, Hiring Committee. (2017).

Member, Stats-Concentration Committee. (2017).

Member, Strategic Plan Committee. (2017).

B. Professional:

Co-Chair, Machine Learning Seminar. (August 2023 - Present).

Member, Texas State University, San Marcos, TX, United States. (December 2021 - Present).

Reviewer / Referee, Mathematical Reviews/MathSciNet. (November 2021 - Present).

[Reviewing for Mathematical ReviewsMathSciNet-1.pdf](#)

Chair, Numerical Methods for Data Science in Science and Engineering, San Marcos, TX, United States. (September 2021 - Present).

Reviewer / Referee, Electronic Research Archive. (March 2021 - Present).

Reviewer / Referee, Computational Methods in Applied Mathematics. (August 2020 - Present).

[CMAM20200039R1 Thank You for Reviewing-1.pdf](#)

Editorial Review Board Member, Kangwon-Kyunggi Mathematical Society, Chuncheon, South Korea. (September 1, 2021 - August 31, 2025).

[\(Prof LeeYoungJu\) Letter of Appointment-2.pdf](#)

Reviewer / Referee, NSF. (January 17, 2024).

Chair, One Day Symposium on Data Science and Machine Learning, San Marcos, TX, United States. (September 30, 2022).

[symposium-1.pdf](#)

Reviewer / Referee, NSF. (December 2021 - January 2022).

Additional Comments: I have reviewed a total of 20 proposals and participated in panel discussion.

Reviewer / Referee, IMA Journal of Numerical Analysis. (2021).

[Thank you for submitting your review of Manuscript ID IMAJNACE2021031R1 for the IMA Journal of Numerical Analysis-1.pdf](#)

Reviewer / Referee, Journal of Scientific Computing. (2021).

[Thank you let us know how we can improve the reviewing process
EMID17a145bad7caf6b9-1.pdf](#)

Reviewer / Referee, Computational Geoscience. (January 2019 - 2019).

Coordinator / Organizer, Minisymposium for International Multigrid Conference (IMG 2019), Kunming, China. (August 11, 2019 - August 16, 2019).

Reviewer / Referee, Numerical Linear Algebra with Applications. (September 2018 - January 2019).

Reviewer / Referee, Computers and Fluids. (2018).

[Reviewer Notification of Editor Decision-1.pdf](#)

Reviewer / Referee, Computers and Mathematics with Applications. (2015 - 2018).

Reviewer / Referee, Applied Numerical Mathematics. (November 2017 - January 2018).

Reviewer / Referee, Applicable Analysis. (2017).

Reviewer / Referee, Numerical Linear Algebra with Applications. (2017).

Reviewer / Referee, Science China Mathematics. (2017).

Member, NSF. (March 2017).

Additional Comments: I have participated in NSF as a review panel.

Reviewer / Referee, Numerische Mathematik. (2015).

Reviewer / Referee, SIAM Journal on Numerical Analysis. (2015).

Coordinator / Organizer, AMS meeting at Texas Tech University. (2014).

Coordinator / Organizer, SIAM Mini Symposium. (2014).

Reviewer / Referee, Numerische Mathematik. (2014).

Reviewer / Referee, Linear Algebra with Applications. (2013 - 2014).

Reviewer / Referee, NSF. (2013 - 2014).

Reviewer / Referee, Non-Newtonian Fluids Mechanics. (2013).

Reviewer / Referee, Communications in Computational Physics. (2011 - 2012).

Reviewer / Referee, Journal of Differential Equations. (2009).

Reviewer / Referee, SIAM Multiscale Modeling and Simulation. (2009).

Reviewer / Referee, International Journal of Computer Mathematics. (2007).

Reviewer / Referee, Numerische Mathematike. (2007).

Reviewer / Referee, Mathematics of Computations. (2006).

F. Service Grants and Contracts:

2. Submitted, but not Funded, External Service Grants and Contracts:

Rusnak, Lucas J (Principal), Treinen, Raymond F (Co-Principal), Sun, Shuying (Co-Principal), Morey, Susan (Co-Principal), White, Alexander (Supporting), Guillen Matheus, Nestor D (Supporting), Lee, Young Ju (Supporting), Ojeda-Ruiz, Ivan (Supporting). Mid-scale RI-1 (M1:IP): Mathematical Information Science Collaborative, NSF, Federal, \$17,529,101.00. (Submitted: January 2023). Grant.

[NSF-RI-1.pdf](#)

G. Service Professional Development Activities Attended:

Workshop, "What's Next? Charting Your Path," Texas State University, San Marcos, TX, United States. (January 18, 2022 - May 1, 2022).

[symposium-1.pdf](#)

Additional Comments: The project I submitted got an award of total \$1500. This fund has been used to organize the one day symposium on Data science and Machine learning on September 30, 2022. This program had a total of 50 registered participants, 9 speakers and 9 poster presentations.