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CONTACT INFORMATION	IBM Thomas J. Watson Research Center 1101 Kitchawan Rd, Yorktown Heights, NY 10598 <i>E-mail:</i> kyeo@us.ibm.com																		
EDUCATION	<table> <tr> <td><b>Brown University</b></td> <td>Providence, RI</td> </tr> <tr> <td>Ph.D. in Applied Mathematics</td> <td>May 2011</td> </tr> <tr> <td>Sc.M. in Applied Mathematics</td> <td>May 2007</td> </tr> <tr> <td><b>Yonsei University</b></td> <td>Seoul, Korea</td> </tr> <tr> <td>Sc.M. in Mechanical Engineering</td> <td>February 2005</td> </tr> <tr> <td>Sc.B. in Civil Engineering</td> <td>February 1999</td> </tr> </table>	<b>Brown University</b>	Providence, RI	Ph.D. in Applied Mathematics	May 2011	Sc.M. in Applied Mathematics	May 2007	<b>Yonsei University</b>	Seoul, Korea	Sc.M. in Mechanical Engineering	February 2005	Sc.B. in Civil Engineering	February 1999						
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PROFESSIONAL EXPERIENCE	<table> <tr> <td><b>IBM Thomas J. Watson Research Center</b></td> <td></td> </tr> <tr> <td>• Senior Research Scientist</td> <td>Jul. 2022 - Present</td> </tr> <tr> <td>• Research Staff Member</td> <td>Oct. 2014 - Jun. 2022</td> </tr> <tr> <td>• Postdoctoral Fellow</td> <td>Jan. 2013 - Sep. 2014</td> </tr> <tr> <td><b>Lawrence Berkeley National Lab.</b></td> <td></td> </tr> <tr> <td>• Postdoctoral Fellow</td> <td>Jul. 2011 - Dec. 2012</td> </tr> <tr> <td><b>Division of Applied Mathematics, Brown University</b></td> <td></td> </tr> <tr> <td>• Visiting Scientist</td> <td>Jul. 2013 - Jun. 2020</td> </tr> <tr> <td>• Research Assistant</td> <td>Sep. 2005 - May 2011</td> </tr> </table>	<b>IBM Thomas J. Watson Research Center</b>		• Senior Research Scientist	Jul. 2022 - Present	• Research Staff Member	Oct. 2014 - Jun. 2022	• Postdoctoral Fellow	Jan. 2013 - Sep. 2014	<b>Lawrence Berkeley National Lab.</b>		• Postdoctoral Fellow	Jul. 2011 - Dec. 2012	<b>Division of Applied Mathematics, Brown University</b>		• Visiting Scientist	Jul. 2013 - Jun. 2020	• Research Assistant	Sep. 2005 - May 2011
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RESEARCH INTERESTS	Time Series Analysis, Deep Learning, Machine Learning, Physics-Statistics Modeling, Uncertainty Quantification, Spatio-Temporal Process																		
PEER-REVIEWED PAPERS	<p>X. Liu &amp; <b>K. Yeo</b>, “Inverse Models for Estimating the Initial Condition of Spatio-Temporal Advection-Diffusion Processes,” <i>Technometrics</i>, accepted (2023).</p> <p>U. Mishra, <b>K. Yeo</b>, K. Adhikari, W. J. Riley, F. M. Hoffman, C. Hudson, &amp; S. Gautam, “Empirical relationships between environmental factors and soil organic carbon produce comparable prediction accuracy as the Machine Learning,” <i>Soil Sci. Soc. Amer. J.</i>, <b>00</b>, 1–14 (2022)</p> <p><b>K. Yeo</b>, Z. Li, &amp; W. Gifford, “Probabilistic Forecast of Random Dynamical System by Generative Adversarial Network,” <i>SIAM J. Sci. Comput.</i>, <b>44</b>, A2150 (2022)</p> <p>X. Liu, <b>K. Yeo</b>, &amp; S. Lu, “Statistical Modeling for Spatio-Temporal Data from Physical Convection-Diffusion Processes,” <i>J. Am. Stat. Assoc.</i> <b>117</b>, 1482–1499 (2022).</p> <p><b>K. Yeo</b>, D. Grullon, F.-K. Sun, D. Boning, &amp; J. Kalagnanam, “Variational inference formulation for a model-free simulation of a dynamical system with unknown parameters by a recurrent neural network,” <i>SIAM J. Sci. Comput.</i>, <b>43</b>, A1305 (2021).</p> <p><b>K. Yeo</b>, “Data-driven reconstruction of nonlinear dynamics from sparse observation,” <i>J. Comput. Phys.</i>, <b>395</b>, 671 (2019)</p> <p>Y. Hwang, H. J. Kim, W. Chang, <b>K. Yeo</b>, &amp; Y. Kim, “Bayesian pollution source identification via an inverse physics model,” <i>Comput. Stat. Data Anal.</i>, <b>134</b>, 76 (2019) Featured in the most downloaded articles (Apr. 2019).</p>																		

- K. Yeo**, Y. Hwang, X. Liu & J. Kalagnanam, “Development of *hp*-inverse model by using generalized polynomial chaos,” *Comput. Methods Appl. Mech. Engrg.*, **347**, 1 (2019)
- K. Yeo** & I. Melnyk, “Deep learning algorithm for data-driven simulation of noisy nonlinear dynamical system,” *J. Comput. Phys.*, **376**, 1212 (2019). Featured in the most downloaded articles (Jan. 2019).
- K. Yeo**, I. Melnyk, N. Nguyen & E. K. Lee, “DE-RNN: Forecasting the probability density function of nonlinear time series,” *Proc. IEEE Int. Conf. Data Mining* (2018).
- A. H. Howard, M. R. Maxey & **K. Yeo**, “Settling of heavy particles in concentrated suspensions of neutrally buoyant particles under uniform shear,” *Fluid Dyn. Res.*, **50**, 041401 (2018).
- X. Liu, **K. Yeo**, & J. Kalagnanam, “Statistical Modeling for Spatio-Temporal Degradation Data,” *J. Qual. Technol.*, **50**, 166 (2018).
- Y. Hwang, E. Barut & **K. Yeo**, “Statistical-physical estimation of pollution emission,” *Statistica Sinica*, **28**, 921 (2018).
- X. Liu, **K. Yeo**, Y. Hwang, J. Singh, & J. Kalagnanam, “A statistical modeling approach for air quality data based on physical dispersion processes and its application to Ozone modeling,” *Ann. Appl. Stat.*, **10**, 756 (2016)
- K. Yeo**, E. Lushi & P. Vlahovska, “Dynamics of inert spheres in active suspensions of micro-rotors,” *Soft Matter*, **12**, 5645 (2016).
- K. Yeo**, E. Lushi & P. Vlahovska, “Collective dynamics in a binary mixture of hydrodynamically coupled micro-rotors,” *Phys. Rev. Lett.*, **114**, 188301 (2015).
- W. Langhans, **K. Yeo** & D. M. Romps, “Lagrangian investigation of the precipitation efficiency of convective clouds,” *J. Atmos. Sci.*, **72**, 1042 (2015).
- K. Yeo** & M.R. Maxey, “Force-coupling simulations of dense finite-inertia suspensions in a linear shear flow,” *Phys. Fluids*, **25**, 053303 (2013).
- K. Yeo** & D.M. Romps, “Measurement of convective entrainment using Lagrangian particles,” *J. Atmos. Sci.*, **70**, 266 (2013).
- K. Yeo** & M.R. Maxey, “Numerical simulations of concentrated suspensions of monodisperse particles in a Poiseuille flow,” *J. Fluid Mech.*, **682**, 491 (2011). Top 10 most downloaded articles (August 2011)
- K. Yeo** & M.R. Maxey, “Anomalous diffusion in wall-bounded suspensions of non-Brownian particles under steady shear,” *Europhys. Lett.*, **92**, 24008 (2010)
- K. Yeo** & M.R. Maxey, “Rheology and ordering transitions of non-Brownian suspensions in a confined shear flow: effects of external torques,” *Phys. Rev. E*, **81**, 062501 (2010)
- K. Yeo** & M.R. Maxey, “Ordering transitions of non-Brownian suspensions in confined steady shear flow,” *Phys. Rev. E*, **81**, 051502 (2010). Selected as PRE Kaleidoscope (May 2010).
- K. Yeo** & M.R. Maxey, “Dynamics of concentrated suspensions of non-colloidal particles in Couette flow,” *J. Fluid Mech.*, **649**, 205 (2010)

- K. Yeo** & M.R. Maxey, “Simulation of concentrated suspensions using the force-coupling method,” *J. Comput. Phys.*, **229**, 2401 (2010)
- K. Yeo**, B.-G. Kim & C. Lee, “On the near-wall characteristics of acceleration in turbulence,” *J. Fluid Mech.*, **659**, 405 (2010)
- K. Yeo**, S. Dong, E. Climent & M.R. Maxey “Modulation of homogeneous turbulence seeded with finite size bubbles or particles,” *Int. J. Multiphase flow*, **36**, 221 (2010)
- K. Yeo**, B.-G. Kim & C. Lee, “Eulerian and Lagrangian statistics in stably stratified turbulent channel flows,” *J. Turbulence*, **10**, 17 (2009)
- J. Jung, **K. Yeo** & C. Lee, “Behavior of heavy particles in isotropic turbulence,” *Phys. Rev. E*, **77**, 016307 (2008)
- E. Climent, **K. Yeo**, M.R. Maxey & G.E. Karniadakis “Dynamic self-assembly of spinning particles,” *J. Fluid Eng.*, **129**, 379 (2007). Top 10 most downloaded articles (April 2007)
- A.M. Reynolds, **K. Yeo** & C. Lee, “Anisotropy of acceleration in turbulent flows,” *Phys. Rev. E*, **70**, 017302 (2004)
- C. Lee, **K. Yeo** & J.-I. Choi, “Intermittent nature of acceleration in near wall turbulence,” *Phys. Rev. Lett.*, **92**, 144502 (2004)
- J.-I. Choi, **K. Yeo** & C. Lee, “Lagrangian statistics in turbulent channel flow,” *Phys. Fluids*, **16**, 779 (2004)
- S.-U. Choi, H. Kang & **K. Yeo**, “Flow and sediment transport in emerging vegetated zone,” *Ecology Civil Eng.*, **6**, 87 (2003)

PREPRINTS

- K. Yeo**, “Short notes on the behavior of recurrent neural network for noisy dynamical system,” <https://arxiv.org/abs/1904.05158>
- K. Yeo**, “Model-free prediction of noisy chaotic time series by Deep Learning,” <https://arxiv.org/abs/1710.01693>

CONFERENCE PRESENTATIONS

- A. Daw, **K. Yeo**, A. Karpatne, & L. J. Klein, “Multi-task Learning for Source Attribution and Field Reconstruction for Methane Monitoring,” Workshop on Digital twins for accelerated discovery of climate and sustainability solutions, IEEE Big Data, Japan, 2022
- X. Liu, **K. Yeo**, L. J. Klein, Y. Hwang, D. Phan, & X. Liu, “Optimal Sensor Placement for Atmospheric Inverse Modeling,” Workshop on Digital twins for accelerated discovery of climate and sustainability solutions, IEEE Big Data, Japan, 2022
- A. Daw, **K. Yeo**, A. Karpatne, & L. J. Klein, “Source Identification and Field Reconstruction of Advection-Diffusion Process from Sparse Sensor Measurements,” Machine Learning and the Physical Sciences Workshop at NeurIPS, LA, 2022
- K. Yeo**, M. Zimoń, M. Zayats, & S. Zhuk, “Super-resolution of Turbulent Flows in the Absence of the High-Resolution Ground Truth,” INFORMS, 2022
- M. Zayats, M. Zimoń, **K. Yeo**, & S. Zhuk, “Super Resolution for Turbulent Flows in 2D: Stabilized Physics Informed Neural Networks,” IEEE Conference on Decision and Control, Mexico, 2022
- C. Wang, **K. Yeo**, X. Jin, A. Cudas, L. J. Klein, & B. Elmegeen , “S3RP: Self-Supervised Super-Resolution and Prediction for Advection-Diffusion Process,” Machine Learning and the Physical Sciences Workshop at NeurIPS, BC, Canada, 2021

- K. Yeo**, A. Cudas, & L. J. Klein, “Physics-guided Spatio-Temporal Super-Resolution of Advection-Diffusion Process,” INFORMS, 2021
- U. Mishra, **K. Yeo**, S. Gautam, K. Nyaupane, & K. Adhikari, “Machine learning to investigate storage and dynamics of soil organic carbon,” Annual Meeting of Ecological Society of America, 2021
- K. Yeo**, D. Grullon, F.-K. Sun, D. Boning, & Jayant Kalagnanam, “Data-driven Simulation Of A Nonlinear Dynamical System With Unknown Parameters,” INFORMS, 2020
- W. Zhou, L. Klein, B. Elmegeen & **K. Yeo**, “Super Resolving Spatial-temporal Weather Predictions Using Deep Learning,” INFORMS, 2020
- K. Yeo**, “Deep learning algorithm for the data-driven simulation of noisy dynamical system,” SIAM Conference on Computational Science and Engineering, WA, 2019
- K. Yeo**, Y. Hwang & E.K. Lee, “Data-driven modeling and forecast of noisy nonlinear dynamics,” Joint Statistical Meetings, BC, Canada, 2018
- K. Yeo**, “Simulation of noisy dynamical system by deep learning,” APS DFD 70th Annual Meeting, CO, 2017
- Y. Hwang, H. Kim, & **K. Yeo**, “Bayesian pollution source identification via an inverse physical model,” Joint Statistical Meetings, MD, 2017
- X. Liu, **K. Yeo**, & J. Kalagnanam, “Statistical modeling for spatio-temporal degradation data,” INFORMS, TN, 2016. The QSR Best Paper Award
- M.R. Maxey, M. Abbas, E. Climent, & **K. Yeo**, “Particle flows at finite Reynolds numbers,” IMA Conference, Cambridge, UK, 2016
- A. Howard, M.R. Maxey, & **K. Yeo**, “Particle fluxes and irreversibility due to shear flow in a bidisperse suspension,” ICMF 2016, Firenze, Italy, 2016
- K. Yeo**, E. Lushi, & P. Vlahovska, “Hydrodynamic self-organization and mixing in suspensions of micro-rotors,” APS March Meeting, MD, 2016
- M. R. Maxey, A. Howard, & **K. Yeo**, “Particle migration in non-uniform flows of Stokes suspensions,” IUTAM, FL, 2015
- K. Yeo**, E. Lushi, & P. Vlahovska, “Phase transition of active rotors due to passive particles,” 2015 APS DFD 68th Annual Meeting, MA 2015
- A. Howard, **K. Yeo**, & M.R. Maxey, “Particle dispersion in non-stationary and non-uniform suspension flows,” 2015 APS DFD 68th Annual Meeting, MA 2015
- K. Yeo**, E. Lushi, & P. Vlahovska, “Self-organization in active suspensions of micro-rotors,” 2015 AIChE Annual Meeting, UT 2015
- K. Yeo**, E. Lushi, & P. Vlahovska, “Phase behavior of monolayer suspensions of counter-rotating rotors,” 2014 APS DFD 67th Annual Meeting, CA 2014
- E. Lushi, **K. Yeo**, & P. Vlahovska, “Collective dynamics and mixing in a suspension of micro-rotors,” 2014 APS DFD 67th Annual Meeting, CA 2014
- Y. Hwang, E. Barut, & **K. Yeo**, “A statistical-physical approach for air quality forecasting,” Joint Statistical Meeting 2014, MA 2014
- Y. Hwang, **K. Yeo**, & E. Barut, “A statistical-physical approach for air quality forecasting,” International Symposium on Business and Industrial Statistics, NC, 2014

- W. Langhans, D.M. Romps & **K. Yeo**, “Lagrangian investigation of the precipitation efficiency of convective clouds,” AMS 31st Conference on Hurricanes and Tropical Meteorology, CA, 2014
- K. Yeo**, “Coupling building-resolving LES with meso-scale NWP: effect of the simulation parameters,” 2013 APS DFD 66th Annual Meeting, PA 2013
- M.R. Maxey, A. Howard, L. WinklerPrinz, A. Tripathi, & **K. Yeo**, “Dispersion of suspensions in unsteady microchannel flows,” 2013 APS DFD 66th Annual Meeting, PA, 2013
- W. Langhans, **K. Yeo**, & D.M. Romps, “A new framework to study convective transport of non-conserved quantities using stochastic Lagrangian particles,” 2013 AGU Annual Meeting, CA, 2013
- M.R. Maxey, G. Azadi, A. Tripathi, & **K. Yeo**, “Dispersion of suspension plugs in microchannels,” APS DFD 65th Annual Meeting, CA, 2012
- K. Yeo** & D.M. Romps, “Lagrangian analysis of the correlation between cloud size and entrainment rate in deep convecting clouds,” 2012 AGU Annual Meeting, CA, 2012
- K. Yeo** & D.M. Romps, “Lagrangian analysis of convective entrainment,” AMS 30th Conference on Hurricanes and Tropical Meteorology, FL, 2012
- K. Yeo** & M.R. Maxey, “Concentrated suspensions in a homogeneous shear flow with finite fluid inertia,” APS DFD 64th Annual Meeting, MD, 2011
- M.R. Maxey & **K. Yeo**, “Flow modulation by finite size particles: From Stokes suspensions to turbulence,” 41st AIAA Fluid Dynamics Conference and Exhibit, HI, 2011
- K. Yeo** & M.R. Maxey, “Anomalous diffusion of non-colloidal suspensions in a Couette flow,” APS DFD 63rd Annual Meeting, CA, 2010
- K. Yeo** & M.R. Maxey, “Numerical simulations of concentrated, non-colloidal suspensions in Poiseuille flows,” Society of Rheology 82nd Annual Meeting, NM, 2010
- K. Yeo** & M.R. Maxey, “Order transition in non-colloidal Couette suspension flows: effects of external torques,” APS DFD 62nd Annual Meeting, MN, 2009
- K. Yeo** & M.R. Maxey, “Numerical simulation of concentrated suspensions of non-colloidal particles in Couette flow,” Society of Rheology 81st Annual Meeting, WI, 2009
- K. Yeo** & M.R. Maxey, “Dynamic self-assembly of non-colloidal particles in Couette flow,” Society of Rheology 81st Annual Meeting, WI, 2009
- L.-P. Wang, H. Gao, L.-S. Luo, Y. Peng, **K. Yeo** & M.R. Maxey, “Comparing particle-resolved simulation methods for moving particles in a viscous fluid,” APS DFD 61st Annual Meeting, TX, 2008
- J. Lim, **K. Yeo** & C. Lee, “On the modification of near-wall structures in stably stratified turbulence,” APS DFD 58th Annual Meeting, IL, 2005
- J. Jeong, **K. Yeo** & C. Lee, “Dispersion of heavy particles in isotropic turbulence,” APS DFD 58th Annual Meeting, IL, 2005
- C. Lee, J. Jeong & **K. Yeo**, “Acceleration, enstrophy and dissipation in isotropic turbulence,” APS DFD 58th Annual Meeting, IL, 2005

**K. Ye** & C. Lee, “On the modification of near-wall structures in stably stratified turbulence,” APS DFD 57th Annual Meeting, WA, 2004.

**K. Ye** & C. Lee, “Modification of near-wall turbulent characteristics under stable stratification,” The 6th KSME-JSME Thermal and Fluid Engineering Conference, Jeju, Korea, 2004.

**K. Ye** & C. Lee, “On the acceleration in inhomogeneous turbulence,” APS DFD 56th Annual Meeting, NJ, 2003.

A.M. Reynolds, **K. Ye** & C. Lee, “On the anisotropy of Lagrangian accelerations in turbulence,” APS DFD 56th Annual Meeting, NJ, 2003.

**K. Ye** & C. Lee, “Acceleration statistics in turbulent channel flow,” 5th Asian Computational Fluid Dynamics, Busan, Korea, 2003.

INVITED TALKS

- KSIAM-MINDS-NIMS International Conference on Machine Learning and PDEs 2022
- Division of Applied Mathematics, Brown University 2022
- Department of Information System and Statistics, Baruch College 2021
- Mathematical Institute for Data Science, POSTECH 2021
- Benjamin Levich Institute, CCNY 2020
- EVS & MCS Seminar, Argonne National Laboratory 2019
- Department of Computational Science and Engineering, Yonsei University 2018
- Division of Applied Mathematics, Brown University 2018
- Department of Industrial Engineering, University of Arkansas 2018
- Frontiers in Applied and Computational Mathematics, NJIT 2017
- Department of Mathematical Sciences, NJIT 2016
- Center for Computational and Applied Mathematics, Purdue University 2016
- Benjamin Levich Institute, CCNY 2015
- Courant Institute of Mathematical Sciences, New York University 2014
- Department of Computational Science and Engineering, Yonsei University 2014
- SEAS Colloquium in Climate Science, Columbia University 2013
- Department of Mechanical Engineering, Northeastern University 2013
- Workshop on Multiphase Turbulent Flows in the Atmosphere and Ocean, NCAR 2012
- Department of Mechanical Engineering, University of Washington 2012
- Department of Mechanical Engineering, University of Delaware 2011
- Department of Computational Science and Engineering, Yonsei University 2010

AWARDS

- IBM Employee Equity Award, IBM 2018,2021,2022
- The Statistics in Physical and Engineering Sciences Award, American Statistical Association 2018
- The Best Refereed Paper Award, INFORMS QSR 2016
- Research Division Award, IBM 2015
- Travel Grant for 2012 European-U.S. Summer School on HPC Challenges 2012
- Sigma Xi Award for excellence in research 2011
- Dissertation Fellowship, Brown University 2011
- Outstanding Master Thesis in Fluid Engineering, KSME 2005

PATENTS

- US Patent, “Predictive multistep model for complex process control,” 2023
- US Patent, “Predictive modeling and control of circumferential balance of blast furnace,” 2020
- US Patent, “Detection algorithms for distributed emission sources of abnormal events,” 2020

US Patent, "Deep learning based predictive model for hot metal temperature of blast furnace with sparse measurement data," 2020

US Patent, "Orchestration of learning and execution of model predictive control tool for manufacturing processes," 2019

US Patent, "Airborne particulate source detection system," 2018