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Professional Preparation

Ph.D.	2013	Cornell University	Applied Mathematics
Diploma	2008	N.T.U.A. (Greece)	Applied Mathematics

Appointments

Professor	Purdue University	7/2024 – present
Associate Professor	Purdue University	7/2020 – 6/2024
Assistant Professor	Purdue University	8/2014 – 6/2020
Postdoctoral Researcher	Argonne National Laboratory	9/2013 – 7/2014
Graduate Research Assistant	Cornell University	8/2008 – 8/2013

Awards and Fellowships:

1. Outstanding mentor of mechanical engineering graduate students (2019).
2. Outstanding engineering teacher (Spring 2018, Fall 2018, Spring 2019).
3. Olin Fellowship, Cornell University, 2008-2009, $55,014.
4. National Technical University of Athens award for best student performance in mathematics, 2003-2005, EUR 300.
5. State Scholarship Foundation (IKY) award for best student performance (2003-2004, 2004-2005), EUR 2,800.

Archival Journal Publications

Notes: The '*' marks a major contributor. The 'G' superscript marks a graduate student.

1. Koutsourelakis, P.*; Bilionis, E.* Scalable Bayesian Reduced-Order Models for Simulating High-Dimensional Multiscale Dynamical Systems. Multiscale Modeling & Simulation 2011, 9 (1), 449–485. https://doi.org/10.1137/100783790. Tier 1

2. Bilionis, I.*; Koutsourelakis, P. S.* Free Energy Computations by Minimization of Kullback–Leibler Divergence: An Efficient Adaptive Biasing Potential Method for Sparse Representations. Journal of Computational Physics 2012, 231 (9), 3849–3870. https://doi.org/10.1016/j.jcp.2012.01.033. Tier 1

3. Bilionis, I.*; Zabaras, N.* Multidimensional Adaptive Relevance Vector Machines for Uncertainty Quantification. Society for Industry and Applied Mathmatics (SIAM) Journal of Scientific Computing 2012, 34 (6), B881–B908. https://doi.org/10.1137/120861345. Tier 1

4. Bilionis, I.*; Zabaras, N.* Multi-Output Local Gaussian Process Regression: Applications to Uncertainty Quantification. Journal of Computational Physics 2012, 231 (17), 5718–5746. https://doi.org/10.1016/j.jcp.2012.04.047. Tier 1

5. Bilionis, I.*; Zabaras, N.* A Stochastic Optimization Approach to Coarse-Graining Using a Relative-Entropy Framework. The Journal of Chemical Physics 2013, 138 (4), 044313. https://doi.org/10.1063/1.4789308. Tier 1

6. Bilionis, I.*; Zabaras, N.; Konomi, B. A.*; Lin, G. Multi-Output Separable Gaussian Process: Towards an Efficient, Fully Bayesian Paradigm for Uncertainty Quantification. Journal of Computational Physics 2013, 241, 212–239. https://doi.org/10.1016/j.jcp.2013.01.011. Tier 1

7. Kristensen, J.*; Bilionis, I.*; Zabaras, N.* Relative Entropy as Model Selection Tool in Cluster Expansions. Physical Review B 2013, 87 (17), 174112. https://doi.org/10.1103/PhysRevB.87.174112. Tier 1

8. Bilionis, I.*; Zabaras, N.* Solution of Inverse Problems with Limited Forward Solver Evaluations: A Bayesian Perspective. Inverse Problems 2014, 30 (1), 015004. https://doi.org/10.1088/0266-5611/30/1/015004. Tier 1

9. Bilionis, I.*; Constantinescu, E. M.*; Anitescu, M.* Data-Driven Model for Solar Irradiation Based on Satellite Observations. Solar Energy 2014, 110, 22–38. https://doi.org/10.1016/j.solener.2014.09.009. Tier 1

10. Bilionis, I.*; Drewniak, B. A.*; Constantinescu, E. M.* Crop Physiology Calibration in the Community Land Model (CLM). Geoscientific Model Development 2015, 8 (4), 1071–1083. https://doi.org/10.5194/gmd-8-1071-2015. Tier 1

11. Chen, P.*; Zabaras, N.*; Bilionis, I.* Uncertainty Propagation Using Infinite Mixture of Gaussian Processes and Variational Bayesian Inference. Journal of Computational Physics 2015, 284, 291–333. https://doi.org/10.1016/j.jcp.2014.12.028. Tier 1

12. Pandita, P.* [G]; Bilionis, I.*; Panchal, J.* Extending Expected Improvement for High-Dimensional Stochastic Optimization of Expensive Black-Box Functions. Journal of Mechanical Design 2016, 138 (11), 111412. https://doi.org/10.1115/1.4034104. Tier 1

13. Tripathy, R.*[G]; Bilionis, I.*; Gonzalez, M.* Gaussian Processes with Built-in Dimensionality Reduction: Applications to High-Dimensional Uncertainty Propagation. Journal of Computational Physics 2016, 321, 191–223. https://doi.org/10.1016/j.jcp.2016.05.039. Tier 1

14. Tsilifis, P.*[G]; Bilionis, I.*; Katsounaros, I.*; Zabaras, N.* Computationally Efficient Variational Approximations for Bayesian Inverse Problems. Journal of Verification, Validation, and Uncertainty Quantification 2016, 1 (3), 031004-031004–031013. https://doi.org/10.1115/1.4034102. Tier 1

15. Alrefae, M. A.*[G]; Kumar, A.*[PD]; Pandita, P.*[G]; Candadai, A. G; Bilionis, I.*; Fisher, T. S.* Process Optimization of Graphene Growth in a Roll-to-Roll Plasma CVD System. AIP Advances 2017, 7 (11), 115102. https://doi.org/10.1063/1.4998770. Tier 1

16. Lee, S.*[G]; Bilionis, I.*; Karava, P.*; Tzempelikos, A.* A Bayesian Approach for Probabilistic Classification and Inference of Occupant Thermal Preferences in Office Buildings. Building and Environment 2017, 118, 323–343. https://doi.org/10.1016/j.buildenv.2017.03.009. Tier 1

17. Sadeghi, S. A.*[G]; Awalgaonkar, N. M.*[G]; Karava, P.*; Bilionis, I.* A Bayesian Modeling Approach of Human Interactions with Shading and Electric Lighting Systems in Private Offices. Energy and Buildings 2017, 134, 185–201. https://doi.org/10.1016/j.enbuild.2016.10.046. Tier 1

18. Dachowicz, A.*[G]; Chaduvula, S. C.*[G]; Atallah, M. J.*; Bilionis, I.*; Panchal, J. H.* Strategic Information Revelation in Collaborative Design. Advanced Engineering Informatics 2018, 36, 242–253. https://doi.org/10.1016/j.aei.2018.04.004. Tier 1

19. Lee, T.*[G]; Turin, S. Y.*; Gosain, A. K.*; Bilionis, I.*; Buganza T. A.* Propagation of Material Behavior Uncertainty in a Nonlinear Finite Element Model of Reconstructive Surgery. Biomechanics and Modeling in Mechanobiology 2018, 17 (6), 1857–1873. https://doi.org/10.1007/s10237-018-1061-4. Tier 1

20. Liu, X.*[G]; Paritosh, P.*[G]; Awalgaonkar, N. M.*[G]; Bilionis, I.*; Karava, P.* Model Predictive Control under Forecast Uncertainty for Optimal Operation of Buildings with Integrated Solar Systems. Solar Energy 2018, 171, 953–970. https://doi.org/10.1016/j.solener.2018.06.038. Tier 1

21. Pandita, P.*[G]; Bilionis, I.*; Panchal, J.*; Gautham, B. P.; Joshi, A.; Zagade, P. Stochastic Multiobjective Optimization on a Budget: Application to Multipass Wire Drawing with Quantified Uncertainties. International Journal for Uncertainty Quantification 2018, 8 (3). https://doi.org/10.1615/Int.J.UncertaintyQuantification.2018021315. Tier 1

22. Sadeghi, S. A.*[G]; Lee, S.*[G]; Karava, P.*; Bilionis, I.*; Tzempelikos, A.* Bayesian Classification and Inference of Occupant Visual Preferences in Daylit Perimeter Private Offices. Energy and Buildings 2018, 166, 505–524. https://doi.org/10.1016/j.enbuild.2018.02.010. Tier 1

23. Shergadwala, M.*[G]; Bilionis, I.*; Kannan, K. N.*; Panchal, J. H.* Quantifying the Impact of Domain Knowledge and Problem Framing on Sequential Decisions in Engineering Design. Journal of Mechanical Design 2018, 140 (10), 101402-101402–101413. https://doi.org/10.1115/1.4040548. Tier 1

24. Tripathy, R. K.*[G]; Bilionis, I.* Deep Uncertainty Quantification (UQ): Learning Deep Neural Network Surrogate Models for High Dimensional Uncertainty Quantification. Journal of Computational Physics 2018, 375, 565–588. https://doi.org/10.1016/j.jcp.2018.08.036. Tier 1

25. Xiong, J.*[G]; Tzempelikos, A.*; Bilionis, I.*; Awalgaonkar, N. M.* G; Lee, S.*[G]; Konstantzos, I.*[G]; Sadeghi, S. A.*[G]; Karava, P.* Inferring Personalized Visual Satisfaction Profiles in Daylit Offices from Comparative Preferences Using a Bayesian Approach. Building and Environment 2018, 138, 74–88. https://doi.org/10.1016/j.buildenv.2018.04.022. Tier 1

26. Lee, S.*[G]; Joe, J*[G].; Karava, P.*; Bilionis, I.*; Tzempelikos, A.* Implementation of a Self-Tuned HVAC Controller to Satisfy Occupant Thermal Preferences and Optimize Energy Use. Energy and Buildings 2019, 194, 301–316. https://doi.org/10.1016/j.enbuild.2019.04.016. Tier 1

27. Lee, S.*[G]; Karava, P.*; Tzempelikos, A.*; Bilionis, I.* Inference of Thermal Preference Profiles for Personalized Thermal Environments with Actual Building Occupants. Building and Environment 2019, 148, 714–729. https://doi.org/10.1016/j.buildenv.2018.10.027. Tier 1

28. Lee, T.*[G]; Gosain, A. K.*; Bilionis, I.*; Tepole, A. B.* Predicting the Effect of Aging and Defect Size on the Stress Profiles of Skin from Advancement, Rotation and Transposition Flap Surgeries. Journal of the Mechanics and Physics of Solids 2019, 125, 572–590. https://doi.org/10.1016/j.jmps.2019.01.012. Tier 1

29. Scheidegger, S.*; Bilionis, I.* Machine Learning for High-Dimensional Dynamic Stochastic Economies. Journal of Computational Science 2019, 33, 68–82. https://doi.org/10.1016/j.jocs.2019.03.004. Tier 1

30. Xiong, J.*[G]; Tzempelikos, A.*; Bilionis, I.*; Karava, P.* A Personalized Daylighting Control Approach to Dynamically Optimize Visual Satisfaction and Lighting Energy Use. Energy and Buildings 2019, 193, 111–126. https://doi.org/10.1016/j.enbuild.2019.03.046. Tier 1

31. Pandita, P.*[G]; Bilionis, I.*, Panchal J.* Bayesian Optimal Design of Experiments for Inferring the Statistical Expectation of Expensive Black-Box Functions. Journal of Mechanical Design 2019, 141(10), https://doi.org/10.1115/1.4043930. Tier 1

32. Peña, F.*[G]; Bilionis, I.*, Dyke, S.* Model Selection and Uncertainty Quantification of Seismic Fragility Functions. American Society of Civil Engineers (ASCE) American Society of Mechanical Engineers (ASME) Journal of Risk and Uncertainty in Engineering Systems, Part A: Civil Engineering 2019, 5(3), 04019009, https://doi.org/10.1061/AJRUA6.0001014. Tier 1

33. Lund, A.*[G]; Dyke, S.*; Song, W.*; Bilionis, I.* Global Sensitivity Analysis for the Design of Nonlinear Identification Experiments. Nonlinear Dynamics 2019, 98, 375-394. https://link.springer.com/article/10.1007/s11071-019-05199-9. Tier 1

34. Naik, P.*[G]; Pandita, P.*[G]; Aramideh, S.*[G]; Bilionis, I.*; Ardekani, A.* Bayesian Model Calibration and Optimization of Surfactant-polymer Flooding. Computational Geosciences 2019, 23, 981-996. https://link.springer.com/article/10.1007/s10596-019-09858-z. Tier 1

35. Lenjani, A.*[G]; Yeum, C. M.*; Dyke, S.*; Bilionis, I.* Automated Building Image Extraction from 360-degree Panoramas for Post-disaster Evaluation. Journal of Computer-aided Civil and Infrastructure Engineering 2020, 1-17. https://doi.org/10.1111/mice.12493. Tier 1

36. Lund, A.*[G]; Dyke, S.*; Song, W.*; Bilionis, I.*, Identification of an Experimental Nonlinear Energy Sink Device Using Unscented Kalman Filter. Mechanical Systems and Signal Processing 2020, 136, 106512. https://www.sciencedirect.com/science/article/pii/S0888327019307332. Tier 1

37. Karumuri, S.*[G]; Tripathy, R.*[G]; Bilionis, I.*; Panchal, J.* Simulator-free Solution of High-Dimensional Stochastic Elliptic Partial Differential Equations Using Deep Neural Networks. Journal of Computational Physics 2020, 404, 109120, https://doi.org/10.1016/j.jcp.2019.109120. Tier 1

38. Lee, T.*[G]; Bilionis, I.*; Buganza T. A.* Propagation of Uncertainty in the Mechanical and Biological Response of Growing Tissues using Multi-fidelity Gaussian Processes. Computer Methods in Applied Mechanics and Engineering 2020, 359, 112724, https://doi.org/10.1016/j.cma.2019.112724. Tier 1

39. Safarkhani, S.*[G]; Bilionis, I.*; Panchal, J.* Towards a Theory of Systems Engineering Processes: A Principal-agent Model of a One-shot, Shallow Process. The Institute of Electrical and Electronics (IEEE) Systems Journal 2020, https://doi.org/10.1109/JSYST.2020.2964668. Tier 1

40. Lenjani, A.*[G]; Bilionis, I.*; Dyke, S.*; Yeum C. M.*; Monteiro, R.* A Resilience-based Method for Prioritizing Post-event Building Inspections. Natural Hazards 2020, 100, 877-896, https://link.springer.com/article/10.1007/s11069-019-03849-0. Tier 1

41. Chaudhari, A. M.*[G]; Bilionis, I.*; Panchal, J.* Descriptive Models of Sequential Decisions in Engineering Design: An Experimental Study. Journal of Mechanical Design 2020, 142(8), 081704, https://doi.org/10.1115/1.4045605. Tier 1

42. Lenjani, A.*[G]; Dyke, S.*; Bilionis, I.*; Yeum C. M.*; Kamiya, K.*; Jongseong C.*; Xiaoyu, L.*[G]; Chowdhury, A. G.* Towards Fully Automated Post-event Data Collection and Analysis: Pre-event and Post-event Information Fusion. Engineering Structures 2020, 208, 109884, https://doi.org/10.1016/j.engstruct.2019.109884. Tier 1

43. Sahu, A.*[G]; Aliprantis, D.*; Bilionis, I.* Quantification and Propagation of Uncertainty in the Magnetic Characteristic of Steel and Permanent Magnets of a Synchronous Machine Drive. IEEE Transactions of Energy Conversion 2020, 35(4), 1926 – 1934, https://doi.org/10.1109/TEC.2020.2998142. Tier 1

44. Safarkhani, S.*[G]; Bilionis, I.*; Panchal, J.* Modeling the System Acquisition using Deep Reinforcement Learning. IEEE Access 2020, 8, 124894 – 124904, https://doi.org/10.1109/ACCESS.2020.3008083. Tier 1

45. Beltran-Pulido, A.*[G]; Aliprantis, D.*; Bilionis, I.*; Munoz, A.*; Leonardi, F.*; Avery, S.*; Uncertainty Quantification and Sensitivity Analysis in a Nonlinear Finite Element Model of a Permanent Magnet Synchronous Machine. IEEE Transactions on Energy Conversion 2020, 35 (4), 2152 – 2161, https://doi.org/10.1109/TEC.2020.3001914. Tier 1

46. Peña, F.*[G]; Bilionis, I.*; Dyke, S.*; Cao, Y.*; Mavroeidis, G. P.*; Efficient Seismic Fragility Functions Through Sequential Selection. Structural Safety, 2020, 87, 101977, https://doi.org/10.1016/j.strusafe.2020.101977. Tier 1

47. Casey, A. D.*[G]; Son, S. F.*; Bilionis, I.*; Barnes, B. C.*; Prediction of Energetic Material Properties from Electronic Structure Using 3D Convolutional Neural Networks. Journal of Chemical Information and Modeling 2020, 60 (10), 4457 – 4473, https://pubs.acs.org/doi/10.1021/acs.jcim.0c00259. Tier 1

48. Lee, S.*[G]; Karava, P.*; Tzempelikos, A.*; Bilionis, I.*; A Smart and Less Intrusive Feedback Request Algorithm Towards Human-centered HVAC Operation. Building and Environment 2020, 184, 107190, https://doi.org/10.1016/j.buildenv.2020.107190. Tier 1

49. Xiong J.*[G]; Awalgaonkar, N.*[G]; Tzempelikos, A.*; Bilionis, I.*; Karava, P.*; Efficient Learning of Personalized Visual Preferences in Daylit Offices: An Online Elicitation Framework. Building and Environment 2020, 181, 107013, https://doi.org/10.1016/j.buildenv.2020.107013. Tier 1

50. Liu, X.*[G]; Dyke, S. J.* Yeum, C. M.*; Bilionis, I.*; Lenjani, I.*[G]; Choi, J.*; Automated Indoor Image Localization too Support Post-Event Building Assessment. Sensors 2020, 20 (6), 1610, https://doi.org/10.3390/s20061610. Tier 1

51. Stowers, C.*[UG]; Lee, T.*[G]; Bilionis, I.*; Gosain, A.*; Tepole, A. B.*; Improving Reconstructive Surgery Design using Gaussian Process Surrogates to Capture Material Behavior Uncertainty. Journal of the Mechanical Behavior of Biomedical Materials 2021, 118, 104340. https://doi.org/10.1016/j.jmbbm.2021.104340. Tier 1

52. Lund, A.*[G]; Bilionis, I.*; Dyke, S. J.*; Variational Inference for Nonlinear Structural Identification, Journal of Applied and Computational Mechanics 2021, 7, Special Issue, 1218-1231, https://dx.doi.org/10.22055/jacm.2020.32626.2049. Tier 1

53. Liu, X.*[G]; Lee, S.*; Bilionis, I.*; Karava, P.*; Joe, J.*; Sadeghi, A.*; A User-interactive System for Smart Thermal Environment Control in Office Buildings. Applied Energy 2021, 298, 117005, https://doi.org/10.1016/j.apenergy.2021.117005. Tier 1

54. Sang, W. H.*[G]; Karava, P.*; Bilionis, I.*; Braun, J.*; A Data-driven Model for Building Energy Normalization to Enable Eco-feedback in Smart and Connected Multi-family Residential Buildings. Journal of Building Performance Simulation 2021, 14 (4), 343-365, https://doi.org/10.1080/19401493.2021.1928755. Tier 1

55. Pandita P.*[G]; Tsilifis, P.*; Awalgaonkar, N.*[G]; Bilionis, I.*; Panchal, J.*; Surrogate-based sequential Bayesian experimental design using non-stationary Gaussian processes. Computer Methods in Applied Mechanics and Engineering 2021, 385, 114007, https://doi.org/10.1016/j.cma.2021.114007. Tier 1

56. Ogunsina, K.* [G]; Bilionis, I.*; DeLaurentis, D.*; Exploratory Data Analysis for Airline Disruption Management. Machine Learning with Applications 2021, 6, 100102, https://doi.org/10.1016/j.mlwa.2021.100102. Tier 1

57. Ham, S.*[G]; Karava, P.*; Bilionis, I.*; Braun, J.*; Real-time Model for Unit-level Heating and Cooling Energy Prediction in Multi-family Residential Housing. Journal of Building Performance Simulation 2021, 14 (4), 420-445, https://doi.org/10.1080/19401493.2021.1968495. Tier 1

58. Choi, J.*; Park, J. A.*; Dyke, S.*; Yeum, C. M.*; Liu, X., Lenjani, A.*[PD]; Bilionis, I.*; Similarity Learning to Enable Building Searches in Post-event Image Data. Computer-aided Civil and Infrastructure Engineering 2022, 37 (2), 261-275, https://doi.org/10.1111/mice.12698. Tier 1

59. Ham, S.*[G]; Karava, P.*; Bilionis, I.*; Braun, J.*; A Scalable and Practical Method for Disaggregating Heating and Cooling Electrical Usage Using Smart Thermostat and Smart Metre Data. Journal of Building Performance Simulation 2022, 15 (2), 251-267, https://doi.org/10.1080/19401493.2022.2032352. Tier 1

60. Zhong, X.*[G]; Bilionis, I.*; Ardekani, A.*; A Framework to Optimize Spring-driven Autoinjectors. International Journal of Pharmaceutics 2022, 617, 121588, https://doi.org/10.1016/j.ijpharm.2022.121588. Tier 1

61. Liu, X.*[G]; Dyke, S.*; Lenjani, A.*[PD]; Bilionis, I.*; Zhang, X.*; Choi, J.*; Automated Image Localization to Support Rapid Building Reconnaissance in a Large-scale Area. Computer-Aided Civil and Infrastructure Engineering 2022, https://doi.org/10.1111/mice.12828. Tier 1.

62. Kim, H.*[G]; Ham, S.*[G]; Promann; M.*[PD]; Devarapalli, H.*; Bihani, G.*[G]; Ringenberg T.*[G]; Kwarteng, V.*[G]; Bilionis, I.*; Braun, J. E.*; Taylor Rayz, J.*; Raymond, L.*; Reimer, T.*; Karava, P.*; MySmartE – An Eco-feedback and Gaming Platform to Promote Energy Conserving Thermostat-adjustment Behaviors in Multi-unit Residential buildings. Building and Environment 2022, 221, 109252, https://doi.org/10.1016/j.buildenv.2022.109252. Tier 1.

63. Beltrán-Pulido, A.*[G]; Bilionis, I.*; Aliprantis, D.*; Physics-informed Neural Networks for Solving Parametric Magnetostatic Problems. IEEE Transactions on Energy Conversion 2022, https://doi.org/10.1109/TEC.2022.3180295. Tier 1

64. Shergadwala, M.*; Panchal, J.*; Bilionis, I.* How does Past Performance of Competitors Influence Designers' Cognition, Behaviors, and Outcomes? Journal of Mechanical Design 2022, 144(10), 101401, https://doi.org/10.1115/1.4054604. Tier 1

65. Thomas, A. J.*[G]; Barocio, E.*; Bilionis, I.*; Pipes, R. B.*; Bayesian Inference of Fiber Orientation and Polymer Properties in Short Fiber-reinforced Polymer Composites. Composites Science and Technology 2022, 228, 109630, https://doi.org/10.1016/j.compscitech.2022.109630. Tier 1

66. Hans, A.*[G]; Chaudhari A. M.*[G]; Bilionis, I.*; Panchal, J.*; A Bayesian Hierarchical Model for Extracting Individuals' Theory-Based Causal Knowledge. Journal of Computing and Information Science in Engineering 2023, 23 (3), 031011, https://doi.org/10.1115/1.4055596. Tier 1

67. de Lucio, M.*[G]; Leng, Y.*[G]; Hans, A.*[G]; Bilionis, I.*; Brindise, M.*; Ardekani, A.*; Vlachos, P.*; Gomez, H.*; Modeling Large-volume Subcutaneous Injection of Monoclonal Antibodies with Anisotropic Porohyperelastic Models and Data-driven Tissue Layer Geometries. Journal of the Mechanical Behavior of Biomedical Materials 2023, 138, 105602, https://doi.org/10.1016/j.jmbbm.2022.105602. Tier 1

68. Karumuri, S.*[G]; McCluer, Z.[G]; Strachan, A.; Titus, M.; Bilionis, I.*; Hierarchical Bayesian Approach to Experimental Fusion: Application to Strength Prediction of High Entropy Alloys from Hardness Measurements. Computational Materials Science 2023, 217, 111851, https://doi.org/10.1016/j.commatsci.2022.111851. Tier 1

69. Kim, H.*[G]; Bilionis, I.*; Karava, P.*; Braun J.*; Human Decision Making During Eco-feedback Intervention in Smart and Connected Energy-aware Communities. Energy and Buildings, 2023, 112627, https://doi.org/10.1016/j.enbuild.2022.112627. Tier 1

70. Sree, V.*[G]; Zhong, X.*[G]; Bilionis, I.*; Ardekani, A.*; Tepole, A. B.*; Optimizing Autoinjector Devices Using Physics-based Simulations and Gaussian Processes. Journal of the Mechanical Behavior of Biomedical Materials, 2023, 105695, https://doi.org/10.1016/j.jmbbm.2023.105695. Tier 1

71. Alberts, A.*[G]; Bilionis, I.*; Physics-informed Information Field Theory for Modeling Physics Systems with Uncertainty Quantification. Journal of Computational Physics, 2023, 486 (112100), https://doi.org/10.1016/j.jcp.2023.112100. Tier 1

72. Mishra, S.*[G]; Karumuri, S.*[PD]; Mika, V.*; Scott, C.*; Choy, C.*; Sandhage, S. H.*; Bilionis, I.*; Titus, M, S.*; Strachan, A.* Mass uptake during oxidation of metallic alloys: Literature data collection, analysis, and FAIR sharing. Computational Materials Science, 2024, 233 (112671). https://doi.org/10.1016/j.commatsci.2023.112671. Tier 1

73. Thomas, A. J.*[PD]; Jaszczuk, M.*; Barocio, E.*; Ghosh, G.*; Bilionis, I.*; Pipes, B.* Probabilistic physics-guided transfer learning for material property prediction in extrusion deposition additive manufacturing. Computer Methods in Applied Mechanics and Engineering, 2024, 419 (116660). https://doi.org/10.1016/j.cma.2023.116660. Tier 1

74. Taç, V.*[G]; Rausch, M. K.*; Bilionis, I.*; Sahli Costabal, F.*; Tepole, A. B.* Generative hyperelasticity with physics-informed probabilistic diffusion fields. Engineering with Computers, 2024, 1-19. https://doi.org/10.1007/s00366-024-01984-2. Tier 1

75. Hans, A.*[G]; Bhattacharya, S.*[PD]; Hao, K.*[G]; Vlachos, P.*; Bilionis, I.* Bayesian reconstruction of 3D particle positions in high-seeding density flows. Measurement Science and Technology, 2024, 35 (11), 116002. https://doi.org/10.1088/1361-6501/ad6624. Tier 1

76. Hao, K.*[G]; Bilionis, I.* An information field theory approach to Bayesian state and parameter estimation in dynamical systems. Journal of Computational Physics, 2024, 512 (113139). https://doi.org/10.1016/j.jcp.2024.113139. Tier 1.

77. Behjat, A.*; Liu, X.; Forero, O.*; Ibrahimov, R.*; Dyke, S.*; Bilionis, I.*; Ramirez, J.*; Whitaker, D. A computational framework for making early decisions in deep space habitats. Advances in Engineering Software, 2024, 195 (103690). https://doi.org/10.1016/j.advengsoft.2024.103690. Tier 1

78. Karumuri, S.*[G]; Bilionis, I.*; Learning to solve inverse problems: An amortized variational inference approach using Gaussian and flow guides. Journal of Computational Physics, 2024, 511 (113117). https://doi.org/10.1016/j.jcp.2024.113117. Tier 1.

79. Krishnan, R. M.*[G]; Zhang, Z.*; Manikkan, S.*[G]; Parsons, P.*; Dyke, S.*; Bilionis, I.*; Wang, J.*; Xue, C.*; Han, S.*; Azimi, M.*; HabSim-HMS: A systems testbed to investigate situational awareness for extraterrestrial habitation. AIAA Journal, 2024 (in print). https://doi.org/10.2514/1.J064693. Tier 1

Fully Reviewed Book Chapters

1. Kristensen, J.*; Bilionis, I.*; Zabaras N.* Adaptive Simulation Selection for the Discovery of the Ground State Line of Binary Alloys with a Limited Computational Budget. Recent Progress and Modern Challenges in Applied Mathematics, Modeling and Computational Science, vol 79, Springer, New York, pp. 185-211, 2017. https://doi.org/10.1007/978-1-4939-6969-2_6

2. Bilionis, I.*; Zabaras N.* Bayesian Uncertainty Propagation using Gaussian Processes. Handbook of Uncertainty Quantification, no. 16, Cham: Springer International Publishing, pp. 555–599, 2017. https://doi.org/10.1007/978-3-319-11259-6_16-1.

Fully Reviewed Conference Papers

1. Pandita P.*[G], Bilionis I.*, Panchal J.* Extending Expected Improvement for High-Dimensional Stochastic Optimization of Expensive Black-Box Functions. American Society of Mechanical Engineers (ASME). International Design Engineering Technical Conferences and Computers and Information in Engineering Conference, Volume 2B: 42nd Design Automation Conference 2016: V02BT03A060. Charlotte, North Carolina https://doi.org/10.1115/DETC2016-60527.

2. Lee, S.*[G]; Bilionis, I.*; Karava, P.*; and Tzempelikos, A.* A Bayesian Approach for Learning and Predicting Personal Thermal Preference (2016). International High Performance Buildings Conference. Paper 233. West Lafayette, Indiana http://docs.lib.purdue.edu/ihpbc/233.

3. Sadeghi, S. A.*[G]; Awalgaonkar, N.*[G]; Karava, P.*; and Bilionis, I.* A Bayesian Approach for Modeling Occupants' Use of Window Shades" (2016). International High Performance Buildings Conference. Paper 169. West Lafayette, Indiana http://docs.lib.purdue.edu/ihpbc/169.

4. Liu, X.*[G]; Paritosh, P.*[G]; Awalgaonkar, N.*[G]; Bilionis, I.*; Karava, P.* Optimal Solar Energy Utilization in Building Operation under Weather Uncertainty (2018). International High Performance Buildings Conference. Paper 327. West Lafayette, Indiana https://docs.lib.purdue.edu/ihpbc/327.

5. Awalgaonkar, N.*[G]; Xiong, J.*[G]; Bilionis, I.*; Tzempelikos, A.*; and Karava, P.* Design of Experiments for Learning Personalized Visual Preferences of Occupants In Private Offices (2018). International High Performance Buildings Conference. Paper 336. West Lafayette, Indiana https://docs.lib.purdue.edu/ihpbc/336.

6. Lee, S.*[G]; Karava, P.*; Tzempelikos, A.*; Bilionis, I.* An Efficient Method for Learning Personalized Thermal Preference Profiles in Office Spaces. (2018). International High Performance Buildings Conference. Paper 326. West Lafayette, Indiana https://docs.lib.purdue.edu/ihpbc/326.

7. Safarkhani, S.*[G]; Kattakuri, V.*[G]; Bilionis, I.*; Panchal, J.* A Principal-agent Model of Systems Engineering Processes with Application to Satellite Design. Paper presented at the Council of Engineering Systems Universities Global Conference 2018, Tokyo, Japan. https://arxiv.org/abs/1903.06979.

8. Chaudhari A. M.*[G]; Bilionis, I.*; Panchal J. H.* How do Designers Choose Among Multiple Noisy Information Sources in Engineering Design Optimization? An Experimental Study. American Society of Mechanical Engineers (ASME). International Design Technical Conferences and Computers and Information in Engineering Conference. Volume 2A: 44th Design Automation Conference 2018: V02AT03A021.Quebec, Canada https://doi.org/10.1115/DETC2018-85460.

9. Pandita, P.*[G]; Bilionis, I.*; Panchal J. H.* Deriving Information Acquisition Criteria for Sequentially Inferring the Expected Value of a Black-Box function. American Society of Mechanical Engineers (ASME). International Design Technical Conferences and Computers and Information in Engineering Conference. Volume 2A: 44th Design Automation Conference 2018: V02BT03A057.Quebec, Canada https://doi.org/10.1115/DETC2018-85893.

10. Shergadwala M.*[G]; Bilionis I.*, Panchal J. H.* Students as Sequential Decision-Makers: Quantifying the Impact of Problem Knowledge and Process Deviation on the Achievement of Their Design Problem Objective. American Society of Mechanical Engineers (ASME). International Design Engineering Technical Conferences and Computers and Information in Engineering Conference, Volume 3: 20th International Conference on Advanced Vehicle Technologies; 15th International Conference on Design Education 2018: V003T04A011. Quebec, Canada https://doi.org/10.1115/DETC2018-85537.

11. Safarkhani S.*[G]; Bilionis I.*; Panchal J. H.* Understanding the Effect of Task Complexity and Problem-Solving Skills on the Design Performance of Agents in Systems Engineering. American Society of Mechanical Engineers (ASME). International Design Engineering Technical Conferences and Computers and Information in Engineering Conference 2018, Volume 2A: 44th Design Automation Conference ():V02AT03A060. Quebec, Canada https://doi.org/10.1115/DETC2018-85941.

12. Ogunsina, K.*[G]; Davendralingam, N.*; Bilionis, I.*; DeLaurentis, D.* Dimensionality Reduction in a Data-driven Model for Airline Disruption Management. American Institute of Aeronautics and Astronautics (AIAA) Scitech 2019 Forum, San Diego, California. https://doi.org/10.2514/6.2019-0403.

13. Tripathy, R.*[G]; Bilionis, I.* Deep Active Subspaces – A Scalable Method for High-Dimensional Uncertainty Propagation. American Society of Mechanical Engineers (ASME) 2019 International Design Engineering Technical Conferences and Computers and Information in Engineering Conferences, Anaheim, California

14. Chaudhari, A.*[G]; Bilionis, I.*; Panchal, J.* Similarity in Engineering Design: A knowledge-based approach. American Society of Mechanical Engineers (ASME) 2019 International Design Engineering Technical Conferences and Computers and Information in Engineering Conferences, Anaheim, California

15. Lund, A.*[G]; Dyke S. J.*; Song W.*; Bilionis I.* Bayesian Identification of a Nonlinear Energy Sink Device: Method Comparison. In Model Validation and Uncertainty Quantification, Volume 3, 173–75. Springer International Publishing. Conference Proceedings of the Society for Experimental Mechanics Series. 2019. 37th International Modal Analysis Conference, Orlando Florida https://doi.org/10.1007/978-3-030-12075-7_19

16. Lee, S.*[G]; Karava, P.*, Tzempelikos, A.*; Bilionis, I. Integrating Occupants' Voluntary Thermal Preference Responses into Personalized Thermal Control in Office Buildings. Proceedings of CISBAT2019 Conference, Lausanne, Switzerland, September 2019. https://iopscience.iop.org/article/10.1088/1742-6596/1343/1/012138/meta

17. Lee, S.*[G]; Joe, J.*[G]; Karava, P.*; Tzempelikos, A.*; Bilionis, I.* Simulation and Implementation of a Self-tuned Heating, Air Conditioning, and Ventilation (HVAC) Controller. Proceedings of the International Building Performance Simulation Association (IBPSA) 2019 Conference, Rome, Italy, September 2019.

18. Xiong, J.*[G]; Tzempelikos, A.*; Bilionis, I.*; Karava, P.* Dynamic Balancing Between Personalized Daylight Preferences and Lighting Energy Use: Implementation of a Multi-objective Optimization Framework. Proceedings of International Building Performance Simulation Association (IBPSA) 2019 Conference, Rome, Italy, September 2019.

19. Lenjani, A.*[G]; Dyke, S.*; Bilionis, I.*; Yeum, C. M.*; Choi, J.*; Lund, A.*[G]; Maghareh, A.* Hierarchical Convolutional Neural Networks Information Fusion for Activity Source Detection in Smart Buildings. Structural Health Monitoring 2019. http://10.12783/shm2019/32353

20. Ogunsina, K.*[G]; Papamichalis, Marios;* Bilionis, I.*; DeLaurentis, D.*Hidden Markov Models for Pattern Learning and Recognition in a Data-driven Model for Airline Disruption Management. American Institute of Aeronautics and Astronautics Aviation Forum, June 2019, Dallas, Texas. https://arc.aiaa.org/doi/pdf/10.2514/6.2019-3508

21. Hans, A.*[G]; Chaudhari, A. M.*[G]; Bilionis, I.*; Panchal, J.*; Quantifying Individuals' Theory-based Knowledge using Probabilistic Causal Graphs: A Bayesian Hierarchical Approach. ASME IDETC 2020. https://ieeexplore.ieee.org/document/9103068

22. Dyke, S.*; Marais, K.*; Bilionis, I.*; Werfel, J.*; Malla, R.*; Strategies for the Design and Operation of Resilient Extraterrestrial Habitats. Proceedings Volume 11591, Sensors and Smart Structures Technologies for Civil, Mechanical, and Aerospace Systems 2021; 115905. https://doi.org/10.1117/12.2585118

23. ElSayed, K. A.*[G]; Bilionis, I.*; Panchal, J.*; Evaluating Heuristics in Engineering Design: A Reinforcement Learning Approach. ASME IDETC 2021. https://doi.org/10.1115/DETC2021-70425

24. Hans, A.*[G]; Chaudhari, A. M.*; Bilionis, I.*; Panchal, J.*; A Mixed-method Analysis for Schedule and Cost Growth in Defense Acquisition Programs. ASME IDETC 2021. https://doi.org/10.1115/DETC2021-71517

25. Bhattacharya, S.*; Bilionis, I.*;, Vlachos, P.*; Approximate Bayesian Framework for 3D Reconstruction in a Volumetric PIV/PTV Measurement. 14th International Symposium on Particle Image Velocimetry 2021. https://doi.org/10.18409/ispiv.v1i1.90

26. Maghareh, A.*; Lenjani, A.*; Krishnan, M.*[G]; Dyke, S.*; Bilionis, I.*; Role of Cyber-Physical Testing in Developing Resilient Extraterrestrial Habitats. 17th Biennial International Conference on Engineering, Science, Construction, and Operations in Challenging Environments 2021. https://doi.org/10.1061/9780784483374.098

27. Lund, A.*; Bilionis, I.*; Dyke, S.*; Variational Filter for Predictive Modeling of Structural Systems. Model Validation and Uncertainty Quantification, Volume 3. Conference Proceedings of the Society for Experimental Mechanics Series. 2022. Springer, Cham. https://doi.org/10.1007/978-3-031-04090-0_7

28. Beltrán-Pulido, A.*[G]; Sandoval-Aguilar, R.*[G]; Bilionis, I.*; Aliprantis, D.*; Signed distance function-based analytical modeling of electric machine geometry. *2024 IEEE Power and Energy Conference at Illinois (PECI)*, Urbana, IL, USA, 2024, pp. 1-6, https://doi.org/10.1109/PECI61370.2024.10525252.

Conference Papers based on Abstracts or Extended Abstracts and Invited Talks

1. Bilionis, I.*; Koutsourelakis, P. S.* (2010, May 16-21). Coarse-graining in Crystalline Materials through Adaptive Free-energy Calculations. IV European Conference on Computational Mechanics, Paris, France.
2. Bilionis, I.*; Koutsourelakis, P. S.* (2010, May 23-26). Adaptive Free Energy Calculations for Crystalline Materials. SIAM Conference on Mathematical Aspects of Materials Science, Philadelphia, Pennsylvania.
3. Bilionis, I.*; Ma, X.*; Zabaras, N.* (2011, February 28-March 2). Kernel PCA for Stochastic Input Generation of Multiscale Systems. SIAM Computational Science and Engineering Meeting, Reno, Nevada.
4. Bilionis, I.*; Zabaras, N.* (2011, August 1-5). Multi-output Local Gaussian Process Regression: Applications to Uncertainty Quantification. USA/Brazil Symposium on Stochastic Modeling and Uncertainty Quantification, Rio de Janeiro, Brazil.
5. Bilionis, I.*; Zabaras, N.* (2012, April 2-5). Sparse Bayesian Techniques for Surrogate Creation and Uncertainty Quantification. SIAM Conference on Uncertainty Quantification, Raleigh, North Carolina.
6. Bilionis, I.*; Zabaras, N.* (2012, April 2-5). Hierarchical Multi-output Gaussian Process Regression for Uncertainty Quantification with Arbitrary Input Probability Distributions. SIAM Conference on Uncertainty Quantification, Raleigh, North Carolina.
7. Bilionis, I.*; Zabaras, N.* (2012, April 2-5). Uncertainty Quantification with High Dimensional, Experimentally Measured Inputs. SIAM Conference on Uncertainty Quantification, Raleigh, North Carolina.
8. Bilionis, I.*; Zabaras, N.* (2013, February 25-March 1). Building Surrogates of Very Expensive Computer Codes: Applications to Uncertainty Quantification. SIAM Conference on Computational Science and Engineering, Boston, Massachusetts.
9. Bilionis, I.*; Zabaras, N.* (2013, February 25-March 1). Solution of Inverse Problems with Limited Forward Solver Evaluations: A Bayesian Framework. SIAM Conference on Computational Science and Engineering, Boston, Massachusetts.
10. Bilionis, I.*; Zabaras, N.* (2014, March 31-April 3). Solution of Inverse Problems with Limited Forward Solver Evaluations: A Bayesian Framework. SIAM Conference on Uncertainty Quantification, Savannah, Georgia.
11. Chen, P.*; Zabaras, N.*; Bilionis, I.* (2015, March 14-18). Uncertainty Propagation using Infinite Mixtures of Gaussian Processes. SIAM Conference on Scientific Computing and Engineering, Salt Lake City, Utah.
12. Bilionis, I.*; Zabaras, N.* (2015, March 14-18). Gaussian Processes in High-dimensions. SIAM Conference on Scientific Computing and Engineering, Salt Lake City, Utah.
13. Bilionis, I.*; Zabaras, N.* (2015, March 14-18). Detecting Discontinuities and Localized Features using Gaussian Processes. SIAM Conference on Scientific Computing and Engineering, Salt Lake City, Utah.
14. Bilionis, I.*; Constantinescu, E. M.*; Anitescu, M.* (2015, March 14-18). Data-driven Model for Solar Irradiation based on Satellite Observations. SIAM Conference on Computational Science and Engineering, Salt Lake City, Utah.
15. Bilionis, I.*; Panchal, J. H.*; Pandita, P.*G (2015, October 4-8). Materials Design through Value-based Optimization under Uncertainty. Materials Science & Technology, Columbus, Ohio.
16. Bilionis, I.* (January 19 – 22, 2016). Enabling Predictive Simulations for Design and Decision Making under a Limited Budget. Workshop on Uncertainty Quantification for Multiscale Stochastic Systems and Applications, Institute for Pure and Applied Mathematics, University of California Los Angeles, Los Angeles, California.
17. Bilionis, I.*; Tripathy, R.*G; Gonzalez, M.* (2016, April 5-8). Probabilistic Active Subspaces: Learning High-dimensional Noisy Functions without Gradients. SIAM Conference on Uncertainty Quantification, Lausanne, Switzerland.
18. Bilionis, I.*; Pandita, P.*G; Panchal, J.* (2016, June 5-10). Design Optimization with Quantified Uncertainties under a Computational Budget. European Congress on Computational Methods in Applied Sciences and Engineering, Crete Island, Greece.
19. Bilionis, I.* (2016, November 11). Uncertainty Quantification using Embarrassingly Small Numbers of Simulations and Experiments. Brown University, Providence, Rhode Island.

20. Bilionis, I.*; Tripathy, R.*[G] (2017, February 27-March 3). Solving Multi-scale Stochastic Partial Differential Equations using Deep Neural Networks. SIAM Conference on Computational Science and Engineering, Atlanta, Georgia.
21. Bilionis, I.* (2017, March 30). Uncertainty Quantification using Embarrassingly Small Numbers of Simulations and Experiments. Stony Brook University, Stony Brook, New York.
22. Bilionis, I.* (2017, April 7). Uncertainty Quantification using Embarrassingly Small Numbers of Simulations and Experiments. University of Connecticut, Storrs, Connecticut.
23. Bilionis, I.* (2017, June 5 – 9). Variational Reformulation of the Uncertainty Propagation Problem in Linear Partial Differential Equations. Workshop on Probabilistic Scientific Computing: Statistical Inference Approaches to Numerical Analysis and Algorithm Design. Brown University, Providence, Rhode Island.
24. Bilionis, I.*; Tripathy, R.*[G] (2017, July 10-14). Learning Non-linear Correlations Between Multi-fidelity Models using Deep Neural Networks. SIAM Annual Meeting, Pittsburgh, Pennsylvania.
25. Bilionis, I.* (2018, February 19). Making the Most of your Resources: How to Design Simulations and Experiments to Achieve your Engineering Goals. University of Notre Dame, Notre Dame, Indiana.
26. Tripathy, R.*[G]; Bilionis, I.* (2018, April). Deep Neural Networks for Multifidelity Uncertainty Quantification. SIAM Conference on Uncertainty Quantification, Garden Grove, California.
27. Bilionis, I.* (2018, April). Variational Reformulation of the Uncertainty Propagation Problem using Probabilistic Numerics. SIAM Conference on Uncertainty Quantification, Garden Grove, California.
28. Pandita, P.*[G]; Kristensen, J.*; Bilionis, I.* (2018, April). Optimal Information Acquisition for Inferring the Order of Sensitivity Indices. SIAM Conference on Uncertainty Quantification, Garden Grove, California.
29. Karumuri, S.*[G]; Tripathy, R.*[G]; Bilionis, I.*; Panchal, J.* (2018, July). Deep UQ: A Variational Reformulation of the Uncertainty Propagation Problem in Stochastic Elliptic PDEs using Deep Neural Networks. SIAM Annual Meeting, Portland, Oregon.
30. Karumuri, S.*[G]; Tripathy, R.*[G]; Bilionis, I.*; Panchal, J.* (2019, February). Energy Minimizing Deep Neural Networks for Solving High-dimensional Stochastic Partial Differential Equations. SIAM Conference on Computational Science and Engineering, Spokane, Washington.
31. Pandita, P.*[G]; Awalgaonkar, N.*[G]; Bilionis, I.*; Panchal, J.* (2019, February). Inferring Black Box Functions under a Limited Computational Budget. SIAM Conference on Computational Science and Engineering, Spokane, Washington.
32. Tripathy, R.*[G]; Bilionis, I* (2019, February). Learning Deep Neural Network Surrogate Models for High Dimensional and Multi-fidelity Uncertainty Quantification Problems. SIAM Conference on Computational Science and Engineering, Spokane, Washington.
33. Kwarteng, V.*[G]; Kim, H.*[G]; Ham, S. W.*[G]; Bilionis, I.*; Karava, P.*; Castillo, L.* (2019, June) Sociotechnical Modeling and Applying Machine Learning in Peru Applications. Universidad Nacional de San Antonio Abad del Cusco, Cusco, Peru.
34. Bilionis, I.*, Papamichalis, M.*, Kannan, K.* (2019, September) How to Make Costly Decisions Based on Observational Data When you are Uncertain about Causal Relationships, Facebook, Menlo Park, CA.
35. Bilionis, I.* (2019, September) Big Data is not Enough: Thoughts on Causality, Physics-informed Machine Learning and Decision-making, Indy Big Data Conference, Indianapolis, IN.
36. Bilionis, I.*, (2019, October) Physics-informed Machine Learning: A Very Gentle Introduction, National Institute of Health, Bethesda, MD.
37. Bilionis, I.*, (2020, March) Physics-informed Neural Networks and Applications to Engineering Systems, GE Global Research, Albany, NY, (virtual).
38. Bilionis, I.*, (2020, August) High-dimensional uncertainty propagation using Physics-informed Neural Networks, Keynote at ASME IDETC DAC (virtual).
39. Bilionis, I.* (2020, October). Solving high-dimensional stochastic partial differential equations with physics-informed neural networks. Brown University, Providence, Rhode Island. (virtual).
40. Bilionis, I.*; (2020, October) Panel on job prospects after postdoc, Argonne National Laboratory, Mathematics and Computer Science Division, Lemont, IL, (virtual).
41. Bilionis, I.*; (2021, May) A Hands-on Introduction to Physics-informed Machine Learning, NanoHUB, Purdue University, West Lafayette, IN (virtual).
42. Bilionis, I.*; (2021, June) Situational awareness in extraterrestrial habitats: Open challenges, potential applications of physics-informed neural networks, and limitations. Alberto Luiz Coimbra Institute for

Graduate Studies and Research in Engineering, Federal University of Rio de Janeiro, Rio de Janeiro, Brazil (virtual).

43. Bilionis, I.*; (2021, July) Situational awareness in extraterrestrial habitats: Open challenges, potential applications of physics-informed neural networks, and limitations. Centrum Wiskunde & Informatic, University of Amsterdam, Amsterdam, Netherlands (virtual).

44. Bilionis, I.*; (2021, August) Open challenges, potential applications, and limitations of physics-informed neural networks. 3M, Minneapolis, MN (virtual).

45. Bilionis, I.*; (2022, April) A statistical field theory approach to physics-informed machine learning. Royal Statistical Society (North Eastern), UK (virtual)

46. Hao, K.*G; Bilionis, I.; (2022, June) Learning to solve Bayesian filtering problems in real time using amortized variational inference. 19th U.S. National Congress on Theoretical and Applied Mechanics. Austin, TX.

47. Alberts, A.*G; Bilionis, I.; (2023, June) Physics-informed information field theory for modeling physical systems with uncertainty quantification. 5th International Conference on Uncertainty Quantification in Computational Science and Engineering. Athens, Greece.

48. Wang, Z.; Jahanshahi, M. R.; Bilionis, I.; Fu, Y.; Maghareh, A.; Dyke, S. J. Unsupervised Damage Detection for Smart Extraterrestrial Habitats Using Autoencoders and Information Fusion. Structural Health Monitoring, 2023.

49. Rajasekharan, M. K. P.; Alvarenga, B. D.; Ravula, P.; Bilionis, I.; Agent-based Models for Real-time Fault-recovery in Cyber-physical Testbeds for Smart Habitats. ASCEND 2023.

50. Hao, K.; Hans, A.; Bhattacharya, S.; Bilionis, I.; Vlachos, P.; Unbalanced Optimal Transport for Particle Tracking in PTV. Bulletin of the American Physical Society, 2023.

51. Bilionis, I. Feynman path integral formulation of inverse problems: Lifting the assumption that the model is correct. Alan Turing Institute, 2024.

Research Funding:

Summary: ~$70M total from which ~$6.5M allocated for Bilionis.

1. NSF: CDS&E: "Scalable Bayesian Reconstruction of Cardiovascular Hemodynamics via Information Field Theory," $567,284, **PI**.
2. NSF: SCC-IRG Track1: "Smart energy assistants for affordable housing communities," $1,599,996, **Co-PI** 10%. PI. P. Karava.
3. Lilly (Eli) And Company: "Lilly Strategic Partnership 2023-2024," $23,133,515, **Co-PI** 10%, PI. P. Vlachos.
4. AFRL/AFSOR: "Focused Manufacturing of Hypersonic Materials," $1,620,037, **Co-PI** 30%, PI. G. Scott.
5. Cummins, Inc.: "System Model Development with Uncertainty and Adaptility," $866,000, **Co-PI** 50%, PI. P. Meckl.
6. Ford Motor Company: "eMachine design optimization using physics-informed neural networks," $212,450, **PI**.
7. Cummins, Inc: "Real-time health monitoring of engineered systems," $800,000, **Co-PI** 50%, PI. P. Meckl.
8. NSF: S&CC-IRG Track 1: "Sociotechnical systems to enable smart and connected energy aware communities (Extension)", $400,000, **Co-PI** 20%, PI. P. Karava.
9. DOD/ARL: "Machine learning enhanced models: Enabling new materials for hypersonic and protection applications," $500,000, **Co-PI** 20%, PI. Strachan.
10. AFRL/AFOSR: "Focused manufacturing of hypersonic materials," $1,789,993, **Co-PI** 25%, PI. G. Scott (SUNY).
11. Lilly (Eli) And Company: "Injection Biologics 2022", $7,300,000, **Co-PI** 14%, PI. P. Vlachos.
12. NSF: CPS: Medium: "A Meta-Learning Approach to Enable Autonomous Buildings," $994,592, **Co-PI** 33%, PI. P. Karava.
13. Lilly (Eli) And Company: "Lilly Injectable Biologics 2021," $7,200,000, **Co-PI** 14%, PI P. Vlachos.

14. Cummins, Inc.: "Development of a Robust, Dynamic Engine Model Combining Techniques from Empirical Modeling and Physics-Based Modeling," $750,000, **Co-PI** 10%. PI P. Meckl.
15. DARPA: "Computing Contact Problems with Self-Conforming Hybrid Materials," $1,000,000, **Co-PI** 25%. PI A. Arrieta.
16. NSF: DMREF, "Discovery of High-temperature, oxidation-resistant, complex concentrated alloys via data science driven multi-resolution experiments and simulations," $1,738,752, **Co-PI** 25%. PI A. Strachan.
17. NASA, "Resilient Extraterrestrial Habitats Institute," $15,000,000, **Co-PI** 6.5%. PI S. Dyke.
18. DARPA, "Physics-Informed LeaRnIng for Multiscale Systems (PILgRIMS)," $179,037, **Co-PI** 25%. PI N. Zabaras.
19. NSF, "2019 NSF EDSE workshop and grantees meeting: Positioning engineering design and systems engineering (EDSE) research for sustained societal impact," $49,998, **Co-PI** 25%. PI J. Panchal.
20. Purdue University (CRISP), "Automating exposure and probabilistic vulnerability quantification for assets in the built environment using street-view images," $50,000, **PI** 50%.
21. Facebook, "Causal inference on Bayesian graphical networks (confidential application)," $65,000, **Co-PI** 40%. PI K. Kannan.
22. NSF AMPS: Collaborative Research, "Efficient algorithms for ultra-fast detection of power system contingencies in the transient regime," $90,000, **PI** 33%.
23. Ford Motor Company, "Development of computational tools for electric machine design including manufacturing uncertainties," $204,930, **PI** 50%.
24. NSF: CMMI/SYS, "A theoretical framework for understanding strategic behavior in systems engineering," $502,945, **PI** 34%.
25. NSF: CMMI/SYS, "Understanding information acquisition decisions in systems engineering," $649,876, **Co-PI** 25%, PI J. Panchal.
26. NSF: "S&CC-IRG Track 1: Sociotechnical systems to enable smart and connected energy-aware residential communities," $3,581,912, **Co-PI** 20%. PI P. Karava.
27. Purdue University, "Affordable NetZero Housing and Transportation Solutions," $300,000, **Co-PI** 9%. PI L. Raymond.
28. University of Illinois, "Quantifying uncertainties in electric machine design," $25,000, **Co-PI** 50%. PI D. Aliprantis.
29. NSF CyberCEES: Type 2, "Human-centered systems for cyber-enabled sustainable buildings", $1,200,000, **Co-PI** 25%, PI P. Karava.

Graduate Students

1. Maxwell, B.TBD, MS Thesis, Fall 2023-present.
2. Rao, A., TBD, MS Thesis, Fall 2022-present.
3. Shrenik, Z. V., "Investigation of different data-driven approaches for modeling engineered systems." Fall 2020-Spring 2022. Co-advised with Prof. P. Meckl.
4. Sethu, R., TBD, Ph.D., Fall 2021-present. Co-advised with Prof. P. Vlachos.
5. Holt, W., TBD, Ph.D., Fall 2021-present. Co-advised with Prof. P. Vlachos.
6. Manikkan, S., TBD, Ph.D., Fall 2021-present.
7. Hans A., TBD, Ph.D., Fall 2018-present.
8. Heli, Parikh, "Bayesian optimization for design parameters of autoinjectors," MS Thesis, Fall 2021-Spring 2023.
9. Hao, K., "Physics-informed information field theory for dynamical system state estimation and parameter identification," Ph.D., Fall 2020-present. Co-advised with Prof. D. Ziviani.
10. Alberts A., "Physics-informed information field theory", Ph.D., Fall 2018-present.
11. Andres Felipe Beltran Pulido, "Quantification of manufacturing uncertainty in electric machines," Ph.D., Fall 2018-present. Co-advised with Prof. D. Aliprantis.
12. Pillai, M. K. R., "Towards autonomous extra-terrestrial habitats," Ph.D., Spring 2018-present.
13. Vanessa Kwarteng, "Incentivizing energy conserving behaviors in smart and connected communities," Ph.D., Fall 2018-Summer 2023.
14. Karumuri S., "Physics-informed machine learning with applications to high-dimensional uncertainty propagation, inverse, and design problems," Ph.D., Fall 2017-Fall 2022.

15. Nimish Awalgaonkar, "Sequential design of experiments for human preference elicitation with applications to human-building interactions," PhD Fall 2016-Spring 2022.
16. Lund, A., "Variational inference algorithms for health monitoring of structural systems," Ph.D., Fall 2016-Spring 2021. Co-advised with Prof. S. Dyke.
17. Alex D. Casey, "Estimation of melting point and sensitivity in energetic materials with statistical learning," Ph.D., Fall 2018-Spring 2020. Co-advised with S. Son.
18. Salar Safarkani, "Game theoretic foundations of systems engineering," PhD, Fall 2017-Spring 2020.
19. Rohit Tripathy, "High-dimensional uncertainty quantification," PhD, Spring 2016-Fall 2019.
20. Ali Lenjani, "Automating decision support to address system resilience challenges," PhD, Spring 2017-Spring 2020. Co-advised with Prof. S. Dyke.
21. Abhijit, S., "Quantification of uncertainty in magnetic characteristics of steel and its effect on the torque profile of a permanent magnet machine," MS Thesis, Spring 2019.
22. Piyush Pandita, "Bayesian optimal design of experiments for expensive black-box functions under uncertainty," Ph.D., Spring 2019. Co-advised with Prof. J. Panchal.
23. Francisco Pena, "Efficient computation of fragility curves," PhD, Spring 2019. Co-advised with Prof. S. Dyke.
24. Majed Alrefae, "Optimizing a chemical vapor deposition reactor for high quality graphene manufacturing," Ph.D., Spring 2017. Co-advised with Prof. T. S. Fisher.
25. Parth Parintosh, "Gaussian process dynamical models for designing multi-stage manufacturing processes," MS Thesis, Spring 2017. Co-advised with Prof. J. Panchal.
26. Chaolei Chen, "Oil reservoir modeling," MS, Fall 2015-Spring 2016.
27. Zengyi Dou, "Bayesian global optimization approach to the oil well placement problem with quantified uncertainties," MS Thesis, Spring 2015.

Postdoctoral researchers:
1. Bhattacharyya, B., Fall 2021-Spring 2022.
2. Sharmila, K., Spring 2023-present.
3. Thomas, A. J., Fall 2023-present.

Undergraduate Students:
1. Mahira Morris, Spring 2023-present. Working on the visual interface of the command and control for extraterrestrial habitats.
2. Max Bolt, Summer 2022-present. Started as a Cummins intern which I advised on data science issues. He is transitioning to a funded MS thesis student in August 2023.
3. Sayak Chatterjee, Spring 2022. Working on physics informed neural networks.
4. Prathyush Ravula, Summer 2021-Spring 2022. Working on NASA RETHi project on robotic agent simulation.
5. Bernardo De Araujo Alvarenga, Summer 2021-Spring 2022. Working on NASA RETHi project on robotic agent simulation.
6. Jacob Evans, "Literature review of human machine interfaces for complex, critical systems." Summer 2020 undergraduate researcher. Undergraduate researcher Fall 2020.
7. Nicholas Masso, "Stochastic modeling of meteorite showers on the Moon's surface." Undergraduate research assistant Spring 2020 – Fall 2020.
8. Darya Julia Corry, "Fault analysis of photovoltaic panels in a space environment." Undergraduate research assistant Spring 2020.
9. Atharva Hans, "Design experiments for optimal graphene growth using a chemical vapor deposition reactor," SURF student, summer 2017. He continued to work with me during fall 2017, and from summer 2018 until now. He received the Bottomley fellowship for spring 2019.
10. Jinze Li, "Learning algorithms for mechanical computers based on weakly coupled arrays of electromechanical oscillators," Bottomley fellow, spring 2017.
11. Michael Wang, "Quantifying the effect of manufacturing uncertainties in weakly coupled arrays of electromechanical oscillators," SURF student, summer 2017.
12. Martin Figura, "Multi-objective optimization of electric engines," SURF student, summer 2016.
13. Juan Sebastian Martinez Carvajal, "Enhancing graphene manufacturing by designing experiments for the roll-to-roll chemical vapor deposition reactors," SURF student, summer 2016.
14. Rahul, Patni, "Deep neural nets and engineering applications," Bottomley fellow, spring 2016.

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15. Yinuo Li, "Determining minimum energy structures of arbitrary clusters of atoms efficiently using Bayesian global optimization", SURF student, summer 2015.
16. Zixuan Liu, "Solving inverse problems efficiently using Bayesian global optimization," SURF student, summer 2015.
17. Juan Camilo Lopez Ramirez, "Uncertainty analysis of granular crystals using Gaussian processes with built-in dimensionality reduction," SURF student, summer 2015.