

ARMIN ZARE

Department of Mechanical Engineering
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APPOINTMENTS

Assistant Professor of Mechanical Engineering Aug. 2019 – Present
 University of Texas at Dallas, Richardson, TX

Postdoctoral Research Associate Feb. 2017 – Jul. 2019
 Ming Hsieh Department of Electrical and Computer Engineering
 University of Southern California, Los Angeles, CA
 Advisor: Professor Mihailo R. Jovanović

EDUCATION

PhD in Electrical Engineering Dec. 2016
 University of Minnesota, Twin Cities, MN
 Thesis: Low-complexity stochastic modeling of wall-bounded shear flows
 Advisor: Professor Mihailo R. Jovanović

MS in Electrical Engineering Dec. 2016
 University of Minnesota, Twin Cities, MN

BSc in Electrical Engineering Feb. 2010
 Sharif University of Technology, Tehran, Iran
 Thesis: Discretization Effects on the Efficiency of Fractional Order PID Controllers
 Advisor: Professor Mohammad Haeri

AWARDS, HONORS AND RECOGNITION

YOUNG INVESTIGATOR PROGRAM AWARD, Air Force Office of Scientific Research, 2023.

POSTDOCTORAL SCHOLAR TRAVEL AND TRAINING AWARD, University of Southern California, 2018.

INVITED PARTICIPANT, Center for Turbulence Research Summer Program, Stanford University, 2016, 2014.

DOCTORAL DISSERTATION FELLOWSHIP, University of Minnesota, 2015 – 2016.

TRAVEL SCHOLARSHIP, The Burgers Program 2015 Summer Research School on Fluid Dynamics: Topics in Turbulence, University of Maryland, College Park, MD, 2015.

FINALIST, BEST STUDENT PAPER AWARD, American Control Conference, 2014.

TRAVEL SCHOLARSHIP, Workshop on Turbulence in Engineering Applications, Institute for Pure and Applied Mathematics, Los Angeles, CA, 2014.

TRAVEL SCHOLARSHIP, Electrical and Computer Engineering, University of Minnesota, 2012.

GRADUATE FELLOWSHIP, Electrical and Computer Engineering, University of Minnesota, 2010.

RANKED TOP 0.02% IN NATIONWIDE UNIVERSITY ENTRANCE EXAM among 500,000 participants, Iran, 2005.

SEMIFINALIST IN THE NATIONAL MATHEMATICS OLYMPIAD, Iran, 2003.

SECOND RANK IN STATEWIDE COMPETITIONS IN MATHEMATICS AND PHYSICS, Shiraz, Iran, 2003.

MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS

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| <i>Institute of Electrical and Electronics Engineers (IEEE), Control Systems Society</i> | Sept. 2006 – Present |
| <i>American Physical Society (APS), Division of Fluid Dynamics</i> | Aug. 2013 – Present |
| <i>Society for Industrial and Applied Mathematics (SIAM)</i> | Feb. 2021 – Present |

RESEARCH INTERESTS

Distributed systems theory and applications
 Dynamics and control of complex fluid flows
 Energy systems
 Large-scale and distributed optimization

PUBLICATIONS AND SOFTWARE

Journal Papers

- A. H. Bhatt, M. Rodrigues, F. Bernardoni, S. Leonardi, and A. Zare, *Stochastic dynamical modeling of wind farm turbulence*, *Energies*, vol. 16, no. 19, p. 6908 (24 pages), September 2023.
- S. Abootorabi, and A. Zare, *Model-based spectral coherence analysis*, *J. Fluid Mech.*, vol. 958, A16 (32 pages), March 2023.
- D. B. Hewawaduge and A. Zare, *Input-output analysis of stochastic base flow uncertainty*, *Phys. Rev. Fluids*, vol. 7, no. 7, p. 073901 (32 pages), July 2022.
- H. Mohammadi, A. Zare, M. Soltanolkotabi, and M. R. Jovanović, *Convergence and sample complexity of gradient methods for the model-free linear quadratic regulator problem*, *IEEE Trans. Automat. Control*, vol. 67, no. 5, pp. 2435-2450, May 2022.
- W. Ran, A. Zare, and M. R. Jovanović, *Model-based design of riblets for turbulent drag reduction*, *J. Fluid Mech.*, vol. 906, A7 (38 pages), January 2021.
- A. Zare, H. Mohammadi, N. K. Dhingra, T. T. Georgiou, and M. R. Jovanović, *Proximal algorithms for large-scale statistical modeling and sensor/actuator selection*, *IEEE Trans. Automat. Control*, vol. 65, no. 8, pp. 3441-3456, August 2020.
- A. Zare, T. T. Georgiou, and M. R. Jovanović, *Stochastic dynamical modeling of turbulent flows*, *Annu. Rev. Control Robot. Auton. Syst.*, 3:195-219, May 2020.
- W. Ran, A. Zare, M. J. P. Hack, and M. R. Jovanović, *Stochastic receptivity analysis of boundary layer flow*, *Phys. Rev. Fluids*, vol. 4, no. 9, p. 093901 (28 pages), September 2019.
- W. Ran, A. Zare, M. J. P. Hack, and M. R. Jovanović, *Modeling mode interactions in boundary layer flows via Parabolized Floquet Equations*, *Phys. Rev. Fluids*, vol. 4, no. 2, p. 023901 (22 pages), February 2019.
- A. Zare, M. R. Jovanović, and T. T. Georgiou, *Colour of turbulence*, *J. Fluid Mech.*, vol. 812, pp. 636-680, February 2017.
- A. Zare, Y. Chen, M. R. Jovanović, and T. T. Georgiou, *Low-complexity modeling of partially available second-order statistics: theory and an efficient matrix completion algorithm*, *IEEE Trans. Automat. Control*, vol. 62, no. 3, pp. 1368-1383, March 2017.

Refereed Proceedings

- S. Abootorabi, S. Leonardi, M. Rotea, and [A. Zare](#), *Short-term wind forecasting via surface pressure measurements: stochastic modeling and sensor selection*, In Proceedings of the 2024 American Control Conference, Toronto, Canada, Note: To appear.
- M. V. Lingad, M. Rodrigues, S. Leonardi, and [A. Zare](#), *Three-dimensional stochastic dynamical modeling for wind farm flow estimation*, Journal of Physics: Conference Series, 2024, Note: Submitted.
- M. Rodrigues, N. A. Burgess, A. H. Bhatt, S. Leonardi, and [A. Zare](#), *Robustness of two-dimensional stochastic dynamical wake models for yawed wind turbines*, In Proceedings of the 2023 American Control Conference, San Diego, CA, pp. 818-823, 2023.
- A. H. Bhatt, F. Bernardoni, S. Leonardi, and [A. Zare](#), *Stochastic dynamical wake modeling using partially available field measurements*, In Proceedings of the 2022 NAWEA/WindTech Conference, University of Delaware, DE, 2022.
- A. H. Bhatt and [A. Zare](#), *Toward stochastic dynamical wake-modeling for wind farms*, In Proceedings of the 2022 American Control Conference, Atlanta, GA, pp. 5241-5246, 2022.
- D. B. Hewawaduge and [A. Zare](#), *The effect of base flow uncertainty on transitional channel flows*, In Proceedings of the 2022 American Control Conference, Atlanta, GA, pp. 5050-5055, 2022.
- [A. Zare](#), *Data-enhanced Kalman filtering of colored process noise*, In Proceedings of the 60th IEEE Conference on Decision and Control, Austin, TX, pp. 6603-6607, 2021.
- D. B. Hewawaduge, T. H. Summers, and [A. Zare](#), *Robustness of turbulence suppression in channel flows with imperfect transverse wall oscillations*, In Proceedings of the 2021 American Control Conference, New Orleans, LA, pp. 292-297, 2021.
- W. Ran, [A. Zare](#), and M. R. Jovanović, *Frequency-response analysis of riblets for turbulent drag reduction*, In Proceedings of the 24th International Symposium on Mathematical Theory of Network and Systems, Cambridge, UK, 2020.
- W. Ran, [A. Zare](#), M. J. P. Hack, and M. R. Jovanović, *Boundary layer receptivity analysis via the algebraic Lyapunov equation*, In Proceedings of the 2020 AIAA SciTech Forum, Orlando, FL, 2020, p. 0109 (15 pages).
- H. Mohammadi, [A. Zare](#), M. Soltanolkotabi, and M. R. Jovanović, *Global exponential convergence of gradient methods over the nonconvex landscape of the linear quadratic regulator*, In Proceedings of the 58th IEEE Conference on Decision and Control, Nice, France, pp. 7474-7479, 2019.
- W. Ran, [A. Zare](#), and M. R. Jovanović, *Drag reduction in turbulent channel flow over spatially periodic surfaces*, In Proceedings of the 58th IEEE Conference on Decision and Control, Nice, France, pp. 5918-5923, 2019.
- W. Ran, [A. Zare](#), M. J. P. Hack, and M. R. Jovanović, *Relating global and local stochastic receptivity analysis of boundary layer flows*, In Proceedings of the 2019 American Control Conference, Philadelphia, PA, pp. 3212-3217, 2019.
- [A. Zare](#), and M. R. Jovanović, *Optimal sensor selection via proximal optimization algorithms*, In Proceedings of the 57th IEEE Conference on Decision and Control, Miami, FL, pp. 6514-6519, 2018.
- W. Ran, [A. Zare](#), M. J. P. Hack, and M. R. Jovanović, *Low-complexity modeling of mode interactions in boundary layer flows*, In Proceedings of the 2018 American Control Conference, Milwaukee, WI, pp. 134-139, 2018.
- D. Deka, [A. Zare](#), A. Lokhov, M. R. Jovanović, and M. Chertkov, *Estimation of State and Noise Covariances in Power Grids using limited nodal PMUs*, In Proceedings of the 5th IEEE Global Conference on Signal and Information Processing (GlobalSIP), Montreal, Canada, 2017.
- [A. Zare](#), N. K. Dhingra, M. R. Jovanović, and T. T. Georgiou, *Structured covariance completion via proximal algorithms*, In Proceedings of the 56th IEEE Conference on Decision and Control, Melbourne, Australia, pp. 3775-3780, 2017.

- W. Ran, [A. Zare](#), J. W. Nichols, and M. R. Jovanović, *The effect of sponge layers on global stability analysis of Blasius boundary layer flow*, In Proceedings of the 47th AIAA Fluid Dynamics Conference, Denver, CO, pp. 3456, 2017.
- W. Ran, [A. Zare](#), M. J. P. Hack, and M. R. Jovanović, *Low-complexity stochastic modeling of spatially evolving flows*, In Proceedings of the 2017 American Control Conference, Seattle, WA, pp. 3815-3820, 2017.
- W. Ran, [A. Zare](#), M. J. P. Hack, and M. R. Jovanović, *Low-complexity stochastic modeling of spatially evolving flows*, In Proceedings of the 2016 Summer Program, Center for Turbulence Research, Stanford University/NASA, pp. 285-294, 2016.
- [A. Zare](#), M. R. Jovanović, and T. T. Georgiou, *Perturbation of System Dynamics and the Covariance Completion Problem*, In Proceedings of the 55th IEEE Conference on Decision and Control, Las Vegas, NV, pp. 7037-7041, 2016.
- C. Grussler, [A. Zare](#), M. R. Jovanović, and A. Rantzer, *The use of the r^* heuristic in covariance completion problems*, In Proceedings of the 55th IEEE Conference on Decision and Control, Las Vegas, NV, pp. 1978-1983, 2016.
- [A. Zare](#), Y. Chen, M. R. Jovanović, and T. T. Georgiou, *An alternating minimization algorithm for structured covariance completion problems*, In Proceedings of the 22nd International Symposium on Mathematical Theory of Network and Systems, Minneapolis, MN, pp. 117-119, 2016.
- [A. Zare](#), M. R. Jovanović, and T. T. Georgiou, *Alternating direction optimization algorithms for covariance completion problems*, In Proceedings of the 2015 American Control Conference, Chicago, IL, pp. 515-520, 2015.
- [A. Zare](#), M. R. Jovanović, and T. T. Georgiou, *Completion of partially known turbulent flow statistics via convex optimization*, In Proceedings of the 2014 Summer Program, Center for Turbulence Research, Stanford University/NASA, pp. 345-354, 2014.
- [A. Zare](#), M. R. Jovanović, and T. T. Georgiou, *Completion of partially known turbulent flow statistics*, In Proceedings of the 2014 American Control Conference, Portland, OR, pp. 1680-1685, 2014. (**Finalist, Best Student Paper Award**).
- [A. Zare](#), B. K. Lieu, and M. R. Jovanović, *Turbulent drag reduction by streamwise traveling waves*, In Proceedings of the 51st IEEE Conference on Decision and Control, Maui, HI, pp. 3122-3126, 2012.

Abstracts

- M. V. Lingad, M. Rodrigues, S. Leonardi, and [A. Zare](#), *Three-dimensional stochastic dynamical modeling for wind farm flow estimation*, TORQUE, Florence, Italy, May 2024, Note: Submitted.
- S. Abootorabi and [A. Zare](#), *Model-based spectral coherence analysis enhanced by scale-dependent eddy dissipation and anisotropic forcing terms*, in Bulletin of the American Physical Society, Washington DC, November 2023.
- A. Dwivedi, [A. Zare](#), and M. R. Jovanović, *Effect of stochastic base flow uncertainty in transitional high speed compressible flows*, in Bulletin of the American Physical Society, Washington DC, November 2023.
- S. Abootorabi, S. Leonardi, M. Rotea, and [A. Zare](#), *Short-term wind forecasting via surface pressure measurements: stochastic modeling and optimal sensor placement*, in Bulletin of the American Physical Society, Washington DC, November 2023.
- J. W. Rogers, M. Guzman Hernandez, S. Leonardi, and [A. Zare](#), *Analysis of complex wind farm flow over realistic terrain using sparsity-promoting dynamic mode decomposition*, in Bulletin of the American Physical Society, Washington DC, November 2023.
- M. Rodrigues, M. V. Lingad, S. Leonardi, and [A. Zare](#), *Data-enhanced stochastic dynamical modeling of yawed wind turbine wakes*, Wind Energy Science Conference, Glasgow, UK, May 2023.
- M. Rodrigues, A. H. Bhatt, F. Bernardoni, S. Leonardi, and [A. Zare](#), *Stochastic dynamical modeling of wind farm turbulence*, in Bulletin of the American Physical Society, Indianapolis, IN, November 2022.

- S. Abootorabi and [A. Zare](#), *Model-based spectral coherence analysis for high-Reynolds number turbulent shear flows*, in Bulletin of the American Physical Society, Indianapolis, IN, November 2022.
- [A. Zare](#) and S. Abootorabi, *Input-output analysis of turbulent channel flow subject to the imperfect transverse wall oscillations*, in Bulletin of the American Physical Society, Indianapolis, IN, November 2022.
- [A. Zare](#) and S. Abootorabi, *Spectral coherence analysis of turbulent flows using stochastically forced linearized Navier-Stokes*, in Bulletin of the American Physical Society, Phoenix, AZ, November 2021.
- S. Abootorabi and [A. Zare](#), *On the parametric refinement of data-enhanced linearized Navier-Stokes for modeling near-wall turbulences*, in Bulletin of the American Physical Society, Phoenix, AZ, November 2021.
- D. B. Hewawaduge and [A. Zare](#), *Input-output analysis of stochastic base flow uncertainty in channel flows*, in Bulletin of the American Physical Society, Phoenix, AZ, November 2021.
- W. Ran, [A. Zare](#), and M. R. Jovanović, *Model-based design of riblets for turbulent drag reduction*, 8th International Congress of the Serbian Society of Mechanics, Kragujevac, Serbia, June 2021.
- [A. Zare](#), *Spectral Coherence Analysis using Data-Enhanced Physics-Based Models*, SIAM Conference on Computational Science and Engineering, Fort Worth, TX, March 2021.
- [A. Zare](#), D. B. Hewawaduge, *An input-output approach to the robustness analysis of transverse wall oscillations in channel flows*, in Bulletin of the American Physical Society, Chicago, IL, November 2020.
- [A. Zare](#), A. Dwivedi, and M. R. Jovanović, *Toward stochastically forced turbulence closure models*, in Bulletin of the American Physical Society, Seattle, WA, November 2019.
- W. Ran, [A. Zare](#), and M. R. Jovanović, *Model-based analysis of turbulent drag reduction in channel flow over corrugated surfaces*, in Bulletin of the American Physical Society, Seattle, WA, November 2019.
- [A. Zare](#), M. R. Jovanović, and T. T. Georgiou, *Data-driven refinements of physics-based models with application to turbulence modeling*, SIAM Conference on Applications of Dynamical Systems, Snowbird, UT, May 2019.
- [A. Zare](#), J. Jeun, J. W. Nichols, and M. R. Jovanović, *Data-informed dynamic acoustic source modeling in high-speed jets*, in Bulletin of the American Physical Society, Atlanta, GA, November 2018.
- W. Ran, [A. Zare](#), M. J. P. Hack, and M. R. Jovanović, *Receptivity analysis of boundary layer flows subject to stochastic excitation*, in Bulletin of the American Physical Society, Atlanta, GA, November 2018.
- M. R. Jovanović, W. Ran, and [A. Zare](#), *Receptivity analysis of flows over structured corrugated surfaces*, in Bulletin of the American Physical Society, Atlanta, GA, November 2018.
- [A. Zare](#), M. R. Jovanović, and T. T. Georgiou, *Color of turbulence: Low-complexity stochastic dynamical modeling of turbulent flows*, 48th AIAA Fluid Dynamics Conference, Atlanta, GA, June 2018.
- [A. Zare](#), J. W. Nichols, and M. R. Jovanović, *Coherent structures in high Reynolds number turbulent shear flows*, in Bulletin of the American Physical Society, Denver, CO, November 2017.
- W. Ran, [A. Zare](#), M. J. P. Hack, and M. R. Jovanović, *Stochastic modeling of mode interactions via linear parabolized stability equations*, in Bulletin of the American Physical Society, Denver, CO, November 2017.
- [A. Zare](#), W. Ran, M. J. P. Hack, and M. R. Jovanović, *Low-complexity stochastic modeling of spatially evolving flows*, in Bulletin of the American Physical Society, Portland, OR, November 2016.
- [A. Zare](#), Y. Chen, M. R. Jovanović, and T. T. Georgiou, *Stochastic dynamical modeling: Structured matrix completion of partially available statistics*, in 2016 Information Theory and Applications Workshop, San Diego, CA, February 2016.
- [A. Zare](#), M. R. Jovanović, and T. T. Georgiou, *Spatio-temporal frequency responses of turbulent shear flows*, in Bulletin of the American Physical Society, Boston, MA, November 2015.
- [A. Zare](#), M. R. Jovanović, and T. T. Georgiou, *Low-complexity stochastic modeling of turbulent flows*, in SIAM Conference on Control and Its Applications, Paris, France, July 2015.

- [A. Zare](#), Y. Chen, M. R. Jovanović, and T. T. Georgiou, *Low-complexity modeling of partially available second-order statistics via matrix completion*, in SIAM Conference on Control and Its Applications, Paris, France, July 2015.
- [A. Zare](#), M. R. Jovanović, and T. T. Georgiou, *Completion of partially known second-order statistics of turbulent flows*, in Bulletin of the American Physical Society, San Francisco, CA, November 2014.
- M. R. Jovanović and [A. Zare](#), *Model-based design of drag-reducing spanwise wall oscillations*, in Bulletin of the American Physical Society, San Francisco, CA, November 2014.
- [A. Zare](#), R. Moarref, and M. R. Jovanović, *Model-based analysis of the effect of spanwise wall oscillations on drag reduction at high Reynolds numbers*, in Bulletin of the American Physical Society, Pittsburgh, PA, November 2013.

Software

- [A. Zare](#) and M. R. Jovanović, *A customized alternating minimization algorithm for structured covariance completion*, April 2016, available at: www.people.ece.umn.edu/~mihailo/software/ccama/

PRESENTATIONS

Invited and Conference Presentations

- Effect of stochastic base flow uncertainty in transitional high speed compressible flows, 76th Annual Meeting of the American Physical Society, Division of Fluid Dynamics, Washington DC, November 2023.
- Short-term wind forecasting via surface pressure measurements: stochastic modeling and optimal sensor placement, 76th Annual Meeting of the American Physical Society, Division of Fluid Dynamics, Washington DC, November 2023.
- Stochastic modeling and analysis of random surface roughness, Unsteady Aerodynamics Program Review, AirForce Office of Scientific Research, Washington DC, July 2023.
- Data-enhanced stochastic dynamical modeling of yawed wind turbine wakes, Wind Energy Science Conference, Glasgow, UK, May 2023.
- A stochastic framework for uncertainty quantification and data-enhanced modeling, Aerodynamics and Control Seminars, Department of Aeronautics, Imperial College London, London, UK, May 2023.
- Input-output analysis of turbulent channel flow subject to the imperfect transverse wall oscillations, 75th Annual Meeting of the American Physical Society, Division of Fluid Dynamics, Indianapolis, IN, November 2022.
- Color of turbulence: stochastic dynamical modeling of turbulent flows, Aerospace Engineering Seminar Series, Texas A&M University, College Station, TX, November 2022.
- A stochastic framework for uncertainty quantification and data-enhanced modeling of turbulent flows, AEM/CSDy Seminar, University of Minnesota, Minneapolis, MN, October 2022.
- Stochastic dynamical wake modeling using partially available field measurements, 2022 NAWEA/WindTech Conference, University of Delaware, DE, September 2022.
- The effect of base flow uncertainty on transitional channel flows, 2022 American Control Conference, Atlanta, GA, June 2022.
- Data-enhanced Kalman filtering of colored process noise, 60th IEEE Conference on Decision and Control, Austin, TX, December 2021.
- Input-output analysis of stochastic base flow uncertainty in channel flows, 74th Annual Meeting of the American Physical Society, Division of Fluid Dynamics, Phoenix, AZ, November 2021.

- Spectral coherence analysis of turbulent flows using stochastically forced linearized Navier-Stokes, 74th Annual Meeting of the American Physical Society, Division of Fluid Dynamics, Phoenix, AZ, November 2021.
- Data-enhanced physics-based modeling of turbulent flows, Department of Applied Mathematics, University of California, Santa Cruz, CA, October 2021.
- A stochastic framework for the quantification and data-enhanced dynamical modeling of uncertainty, Department of Mechanical Engineering, University of Texas at Dallas, Richardson, TX, October 2021.
- Spectral Coherence Analysis using Data-Enhanced Physics-Based Models, SIAM Conference on Computational Science and Engineering, Fort Worth, TX, March 2021.
- An input-output approach to the robustness analysis of transverse wall oscillations in channel flows, 73rd Annual Meeting of the American Physical Society, Division of Fluid Dynamics, Chicago, IL, November 2020.
- Data-enhanced physics-based modeling of turbulent flows, Center for Control, Dynamical Systems and Computation, University of California at Santa Barbara, Santa Barbara, CA, October 2020.
- Boundary layer receptivity analysis via the algebraic Lyapunov equation, 2020 AIAA SciTech Forum, Orlando, FL, January 2020.
- Drag reduction in turbulent channel flow over spatially periodic surfaces, 58th IEEE Conference on Decision and Control, Nice, France, December 2019.
- Toward stochastically forced turbulence closure models, 72nd Annual Meeting of the American Physical Society, Division of Fluid Dynamics, Seattle, WA, November 2019.
- Modeling and control of complex fluid flows using systems theory and optimization, Mechanical Engineering Faculty Mini-Talks, University of Texas at Dallas, Richardson, TX, September 2019.
- Data-enhanced physics-based modeling of turbulent flows, Department of Mechanical Engineering, University of Texas at Dallas, Richardson, TX, February 2019.
- Optimal sensor selection via proximal optimization algorithms, 57th IEEE Conference on Decision and Control, Miami Beach, FL, December 2018.
- Color of turbulence: Stochastic dynamical modeling of turbulent flows, Institute for Computational Engineering and Sciences, University of Texas at Austin, Austin, TX, December 2018.
- Data-informed dynamic acoustic source modeling in high-speed jets, 71st Annual Meeting of the American Physical Society, Division of Fluid Dynamics, Atlanta, GA, November 2018.
- Color of turbulence: Low-complexity stochastic dynamical modeling of turbulent flows, Center for Turbulence Research Tea Seminar, Stanford University, Stanford, CA, October 2018.
- Color of turbulence: Low-complexity stochastic dynamical modeling of turbulent flows, Special session on modal analysis for flow control, 48th AIAA Fluid Dynamics Conference, Atlanta, GA, June 2018.
- Spectral coherence analysis using data-informed linearized Navier-Stokes, 12th Southern California Flow Physics Symposium, University of Southern California, Los Angeles, CA, April 2018.
- Coherent structures in high Reynolds number turbulent shear flows, 70th Annual Meeting of the American Physical Society, Division of Fluid Dynamics, Denver, CO, November 2017.
- Stochastic dynamical modeling: Structured matrix completion of partially available statistics, Beer Talk Seminar Series, University of Southern California, Los Angeles, CA, May 2017.
- Perturbation of System Dynamics and the Covariance Completion Problem, 32nd Southern California Control Workshop, Caltech, Los Angeles, CA, April 2017.
- Perturbation of System Dynamics and the Covariance Completion Problem, 55th IEEE Conference on Decision and Control, Las Vegas, NV, December 2016.
- Low-complexity stochastic modeling of spatially evolving flows, 69th Annual Meeting of the American Physical Society, Division of Fluid Dynamics, Portland, OR, November 2016.

- Spatio-temporal frequency responses of turbulent shear flows, 68th Annual Meeting of the American Physical Society, Division of Fluid Dynamics, Boston, MA, November 2015.
- Alternating direction optimization algorithms for covariance completion problems, the 2015 American Control Conference, Chicago, IL, July 2015.
- Low-complexity modeling of partially available second-order statistics via matrix completion, 4th Midwest Workshop on Control and Game Theory, Ames, IA, April 2015.
- Completion of partially known second-order statistics of turbulent flows, 67th Annual Meeting of the American Physical Society, Division of Fluid Dynamics, San Francisco, CA, November 2014.
- Completion of partially known turbulent flow statistics, the 2014 American Control Conference, Portland, OR, June 2014.
- Model-based analysis of the effect of spanwise wall oscillations on drag reduction at high Reynolds numbers, 66th Annual Meeting of the American Physical Society, Division of Fluid Dynamics, Pittsburgh, PA, November 2013.
- Turbulent drag reduction by streamwise traveling waves, 51st IEEE Conference on Decision and Control, Maui, HI, December 2012.

Poster Presentations

- Short-term wind forecasting via surface pressure measurements, WindSTAR Industrial Advisory Board Meeting, University of Massachusetts Lowell, Lowell, MA, June 2023.
- Data-enhanced physics-based wake modeling for wind farms, WindSTAR Industrial Advisory Board Meeting, University of Texas at Dallas, Richardson, TX, January 2023.
- Stochastic dynamical wake modeling for wind farms, WindSTAR Industrial Advisory Board Meeting, University of Texas at Dallas, Richardson, TX, January 2022.
- Data-informed physics-based modeling of complex dynamical systems, Meet the Faculty Candidate Poster Session, 57th IEEE Conference on Decision and Control, Miami Beach, FL, December 2018.
- Completion of Partially Known Turbulent Flow Statistics, 2016 Doctoral Research Showcase, University of Minnesota, Minneapolis, MN, April 2016.
- Completion of Partially Known Turbulent Flow Statistics, 2016 MSI Research Exhibition, Minnesota Supercomputing Institute, Minneapolis, MN, April 2016.
- Completion of Partially Known Turbulent Flow Statistics, IMA Annual Program Workshop on Optimization and Parsimonious Modeling, Minneapolis, MN, January 2016.
- Low-complexity stochastic modeling of turbulent flows, The Burgers Program 2015 Summer Research School on Fluid Dynamics: Topics in Turbulence, University of Maryland, College Park, MD, June 2015.
- Low-complexity stochastic modeling of turbulent flows, 2015 MSI Research Exhibition, Minnesota Supercomputing Institute, Minneapolis, MN, April 2015.
- Low-complexity stochastic modeling of turbulent flows, Workshop on Turbulence in Engineering Applications, Institute for Pure and Applied Mathematics, Los Angeles, CA, November 2014.
- Controlling the onset of turbulence by streamwise traveling waves, Energy for Defense Meeting, Minneapolis, MN, May 2013.
- Model-based design of transverse wall oscillations for turbulent drag reduction, E3, Energy, Economy, Environment, the Upper Midwest's premier renewable energy conference, Minneapolis, MN, November 2011.

TEACHING AND CURRICULUM DEVELOPMENT

Teaching, Mechanical Engineering, University of Texas at Dallas

Graduate courses

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|---|---------------------------------------|
| (MECH 6313) <i>Nonlinear Systems</i> | Spring 2021, Spring 2023 |
| (MECH 6323) <i>Robust Control Systems</i> | Spring 2020, Spring 2022, Spring 2024 |

Undergraduate courses

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| (MECH 3340) <i>System Dynamics Modeling and Analysis</i> | Spring 2022, Fall 2022, Spring 2023, Fall 2023 |
| (MECH 2340) <i>Circuits and Applied Electronics</i> | Fall 2020, Fall 2021 |

Guest Lecturer, Electrical and Computer Engineering, University of Southern California

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| (EE 510) <i>Linear Algebra for Engineering</i> | Spring 2019 |
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Guest Lecturer, Electrical and Computer Engineering, University of Minnesota

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|---|-------------------------------------|
| (EE 8215) <i>Nonlinear Systems</i> | Spring 2016 |
| (EE 3015) <i>Recitation Sessions in Signals and Systems</i> | Spring 2013, Spring 2016, Fall 2016 |

Teaching Assistant, Electrical and Computer Engineering, University of Minnesota

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|--|-------------|
| (EE 4231) <i>Linear Control Systems</i> | Fall 2010 |
| (EE 3015) <i>Signals and Systems</i> | Spring 2011 |
| (EE 5231) <i>Linear Systems and Optimal Control</i> | Fall 2012 |
| (EE 8920) <i>Teaching Experience in ECE (course)</i> | Spring 2013 |

Teaching Assistant, Electrical Engineering, Sharif University of Technology

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| <i>Fundamentals of Electrical Engineering II</i> | Fall 2008, Spring 2009 |
| <i>Digital Logic Circuits and Laboratory</i> | Spring 2009, Fall 2009, Spring 2010 |

ADVISING AND MENTORING

PhD Student Mentor

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| Daniel Hartman, Mechanical Engineering, University of Texas at Dallas Research: <i>Data-enhanced control of aerodynamic systems</i> | Aug. 2023 – Present |
| Michael V. Lingad, Mechanical Engineering, University of Texas at Dallas Research: <i>A stochastic dynamical approach to short-term forecasting for wind farms</i> | Jan. 2023 – Present |
| Mohammadamin Naseri, Mechanical Engineering, University of Texas at Dallas Research: <i>Stochastic modeling and analysis of random surface roughness</i> | Aug. 2022 – Present |
| Seyedalireza (Arya) Abootorabi, Mechanical Engineering, University of Texas at Dallas Research: <i>Stochastic modeling and analysis of high-speed wall-bounded turbulence</i> | Aug. 2020 – Present |
| Wei Ran, Aerospace & Mechanical Engineering, University of Southern California Research: <i>Modeling and analysis of parallel and spatially-evolving wall-bounded shear flows</i> | Jun. 2015 – Jul. 2020 |

Master's Student Mentor

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| Jonathan W. Rogers, Mechanical Engineering, University of Texas at Dallas Research: <i>Analysis of complex wind farm flow over realistic terrain using sparsity-promoting dynamic mode decomposition</i> | Jan. 2024 – Present |
| Mireille Rodrigues, Mechanical Engineering, University of Texas at Dallas Research: <i>Yawing effects in wind power plants: stochastic wake modeling and control</i> | Feb. 2022 – Aug. 2023 |
| Aditya Hitesh Bhatt, Mechanical Engineering, University of Texas at Dallas Thesis: <i>Data-enhanced stochastic dynamical modeling for wind farms</i> | Jan. 2021 – Dec. 2022 |
| Dhanushki Hewawaduge, Mechanical Engineering, University of Texas at Dallas Thesis: <i>Modeling and analysis of stochastic base flow uncertainties in wall-bounded shear flows</i> | Jan. 2020 – Dec. 2022 |
| Harshad Deshmane, Electrical and Computer Engineering, University of Minnesota Research: <i>System Identification via Nuclear Norm Regularization</i> | Jun. 2013 – Jul. 2014 |

Undergraduate Research Mentor

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| Research Experience for Undergraduates in Wind Energy Systems <i>Short-term wind forecasting using limited surface pressure sensors</i> Martin A. Ibritam | May 2023 – July 2023 |
| Jonathan W. Rogers, Mechanical Engineering, University of Texas at Dallas Research: <i>Wind farm flow analysis using modal decomposition techniques</i> | Aug. 2022 – December 2023 |
| Research Experience for Undergraduates in Wind Energy Systems <i>Data-enhanced physics-based wake modeling for wind farms</i> Team members: Michael V. Lingad and Nicolas A. Burgess <i>Wind farm flow analysis via sparsity-promoting dynamic mode decomposition</i> Team members: Jonathan W. Rogers | May 2022 – July 2022 |

Undergraduate Senior Design Project Client

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| Parallel CCAMA: convex optimization package for data-enhanced stochastic modeling | Spring 2022, Fall 2022 |
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Undergraduate Senior Design Project Mentor

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| ICU in a Box | Fall 2023, Spring 2024 |
| Telepresence Robot with Simultaneous Movement and Actions | Fall 2022, Spring 2023 |
| Medical 3-D Body Part Scanner | Fall 2021, Spring 2022 |
| Automated camera alignment and focus tool | Fall 2019, Spring 2020 |
| <ul style="list-style-type: none"> 1st PLACE, 2020 ASME Student Manufacturing Design Competition | |

High-school Student Mentor

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| 2023 CAST/UTD STEM Bridge Summer Camp Project: <i>The effect of riblet-mounted surfaces on flight aerodynamics</i> | Jun. 2023 – Jul. 2023 |
| 2022 CAST/UTD STEM Bridge Summer Camp Project: <i>Airfoil shape optimization</i> | Jun. 2022 – Jul. 2022 |
| Aditya Behre, 12th grader at School for the Talented and Gifted Magnet Project: <i>Low-complexity modeling for fluid flows</i> | Jun. 2021 – Dec. 2021 |

Current position: Computer Science student at University of Texas at Austin

Doctoral Defense Committee Member

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| Jubeyar Rahman, Mechanical Engineering, UTD | Jul. 2023 – present |
| Karthik Ganapathy, Mechanical Engineering, UTD | Oct. 2023 |
| Zachary J. Patterson, Computer Science, UTD | Jul. 2023 |
| Sahand Hadizadeh Kafash, Mechanical Engineering, UTD | Nov. 2022 |
| Benjamin Gravell, Mechanical Engineering, UTD | Apr. 2022 |
| Venkatraman Renganathan, Mechanical Engineering, UTD | Jun. 2021 |

Visiting Scholars Hosted

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| Prof. Christian Grussler, Technion - Israel Institute of Technology | Feb. 2 – Feb. 9 2023 |
| Anubhav Dwivedi, PhD Student, University of Minnesota | Sept. 29 – Oct. 5 2019 |

PROFESSIONAL SERVICES AND OUTREACH ACTIVITIES

Panelist

National Science Foundation, CBET

Referee

AIAA Journal and Conference
American Control Conference
Applied Sciences
Automatica
Fluids
IEEE Conference on Decision and Control
IEEE Control Systems Letters
IEEE Multi-Conference on Systems and Control
IEEE Transactions on Automatic Control
Indian Control Conference
International Journal of Heat and Fluid Flow
Journal of Fluid Mechanics
Learning for Dynamics and Control (L4DC)
Numerical Algorithms
Physics of Fluids
Physical Review Fluids
Physical Review Research
Theoretical and Computational Fluid Dynamics

Competition/Project Judge

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| <i>Summer Platform for Undergraduate Research (SPUR) program poster presentations, UTD</i> | Jul. 2022 |
| <i>Graduate poster competition, Mechanical Engineering, UTD</i> | Oct. 2021 |
| <i>UTDesign Expo, Biomedical and Mechanical Engineering capstone projects, UTD</i> | Dec. 2020, May 2021 |
| <i>ME Demo Day, Circuits and Applied Electronics, Mechanical Engineering, UTD</i> | Dec. 2019 |

Student Poster Competition, 9th Annual Research Festival, Ming Hsieh Institute, USC Nov. 2018

Conference Session Chair

Co-Chair - “*Advanced Control of Wind Farms and Wind Turbines Session II: Wind farm wake control*”,
2023 American Control Conference Jun. 2023

Chair - “*Flow Control: Drag Reduction II*”, 75th APS DFD Annual Meeting Nov. 2022

Chair - “*Uncertain Systems*”, 2022 American Control Conference Jun. 2022

Chair - “*Iterative Learning Control II*”, 58th IEEE Conference on Decision and Control Dec. 2019

Co-chair - “*Distributed Parameter Systems II*”, 58th IEEE Conference on Decision and Control Dec. 2019

Co-chair - “*Feedback Flow Control*”, 2018 AIAA Aviation Forum Jun. 2018

Chair - “*Surface Roughness: General*”, 70th APS DFD Annual Meeting Nov. 2017

Co-chair - “*Optimization II*”, 55th IEEE Conference on Decision and Control Dec. 2016

Committees at the University of Texas at Dallas

Member - *Ad-hoc Committee; Qualifying Exam revision*, Mechanical Engineering, UTD Mar. 2021 – present

Member - *Graduate Committee*, Mechanical Engineering, UTD Aug. 2021 – present

Member - *Faculty Recruiting Committee*, Mechanical Engineering, UTD Jan. 2021 – May 2022

Member - *Computer Committee*, Mechanical Engineering, UTD Aug. 2020 – Dec. 2020

Guest Speaker

Speaker - URBAN STEM Pop-Up session, “The aerodynamics of airfoils and how math can aid
their optimal design”, UTD Feb. 2023

Panelist - CSSC Spring 2022 event “Learning & Teaching”, UTD Apr. 2022

Speaker - Roundtable with faculty, Hobson Wildenthal Honors College, UTD Apr. 2021

LANGUAGES

English (proficient), Farsi (native), French (basic)