# Kursat Kara, Ph.D.

Assistant Professor, School of Mechanical & Aerospace Engineering, Oklahoma State University

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Kara Aerodynamics Research Laboratory


## EDUCATION

- **Ph.D. Aerospace Engineering, Old Dominion University, Norfolk, VA, Dec 2008**
  "Hypersonic Boundary-Layer Receptivity Due to Acoustic Disturbances over Cones"
  Advisors: Dr. P. Balakumar (NASA – LaRC) and Dr. O. A. Kandil (ODU)
- **M.Sc. Aeronautical Engineering, Istanbul Technical University, Turkey, May 2003**
  "Simulation and Analysis of 3-D Separated Flow around Sphere and Circular Cylinder"
  Advisor: Dr. M. F. Unal
- **B.Sc. Aeronautical Engineering, Istanbul Technical University, Turkey, Jun. 1999**
  "Comparison of Source and Doublet Panel Methods for 2-D Airfoils"

## EXPERIENCE

**Assistant Professor, Aug 2019 – Present**
School of Mechanical and Aerospace Engineering, Oklahoma State University, Stillwater, OK

- Graduate Student Advising
  - Completed
    - M.Sc., Mobashera Alam, "Computational Analysis of Sweeping Jet Actuator using Dynamic Mode Decomposition, " Fall 2022.
  - In-Progress:
    - Ph.D., Furkan Oz, Fall 2020 – date, Hypersonic Boundary-Layer Stability Prelim. Exam: 04/21/2022
    - Ph.D., Rohit Vuppala, Fall 2020 – date, Atmospheric Gust Prediction for sUAS. Prelim. Exam: 04/14/2022
- Undergraduate Student Research Advising
  - Chris Dyke (AE), Spring 23 -, "Supersonic Reentry Vehicle Dynamic Stability"
  - Peyton Pierson (AE), Fall 22 -, "Supersonic Reentry Vehicle Dynamic Stability"
  - Serge Amangoua (AE), Fall 22 -, "Urban Canyon Wind Prediction"
  - Tuyen Nguyen (AE), Fall 22-, "Supersonic Reentry Vehicle Dynamic Stability"
  - Isaiah Richmond (AE), Fall 22, "Transonic Reentry Vehicle Dynamic Stability"
  - Isaiah Richmond (AE), Fall 21- Spring 22, "Sweeping Jet Actuator."
  - Tuyen Nguyen (AE), Fall 21- Spring 22, "Hypersonic Flow Simulation."
  - Jared Greif (AE), Fall 21– Spring 22, "Hypersonic BL Transition."
  - Zackary Mitchell (AE), Fall 21–Spring 22, "Hypersonic BL Transition."
  - Kaitlyn Matic (AE), Fall 21 – Spring 22, "Sweeping Jet Actuator for Aerodynamic Flow Control."
  - Michael Cuthbertson (AE), Fall 21 – Spring 22, "NASA Trap Wing CFD Analysis."
  - Trevor Marshall (AE), Summer 21 – Spring 22, "Flow Separation Control over a NACA 0012 Airfoil."

- Thomas Goebel (AE), Summer 21 – Spring 22, "Wall Cooling Effect on Hypersonic Boundary-Layer Transition."
- Evan R. Evans (AE), Spring 21 – Spring 22, "Direct Numerical Simulation of Hypersonic Boundary-Layer Transition."
- Tyler R. Landua (AE), Fall 20 – Spring 22, "Large-Eddy Simulation around Buildings in Crosswinds for Unmanned Air System Operations."
- Romain Bailey (AE), Fall 20-Spring 21, "Large-Eddy Simulation over Terrain for Unmanned Air System Operations."

- Faculty advisor to 30 MAE students Fall 2019–date
- Developed/Delivered the following undergraduate and graduate courses.
  - MAE 3293 Fundamentals of Aerodynamics, Fall 19 (118 Students)
  - MAE 3293 Fundamentals of Aerodynamics, Fall 20 (161 Students)
  - MAE 3293 Fundamentals of Aerodynamics, Fall 21 (101 Students)
  - MAE 3293 Fundamentals of Aerodynamics, Fall 22 (120 Students)
  - MAE 5943 Unsteady Aerodynamics and Aeroacoustics, Fall 20 (10 Students)
  - MAE 5943 Unsteady Aerodynamics and Aeroacoustics, Spring 23 (12 Students)
  - MAE 5010 Quantum Computational Fluid Dynamics, Spring 21 (2 Students)
  - MAE 5010 Hydrodynamic Stability and Transition to Turbulence, Spring 22 (10 students)
  - MAE 5010 DMD for the SWJ Actuator, Spring 22 (1 Student)
  - MAE 6000 Doctoral Dissertation (2 Students)
  - MAE 5000 Master's Thesis (1 Student)
- Funded Projects
  - Co-PI, $649,879 (50%), NASA Early Stage Innovations (ESI22) (Topic 3 - Improved Methods for Characterization of Blunt-Body Dynamic Stability), "Physics-Guided Multifidelity Learning for Characterization of Blunt-Body Dynamic Stability," Jan 17, 2023 – Jan 16, 2026, Award Number 80NSSC23K0231. Collaborator: Omer San (OSU).
  - PI, $29,963 (100%), NASA Oklahoma EPSCoR Research Initiation Grant 2022, "Direct Numerical Simulation of Broadband Acoustic Metasurfaces to Stabilize Acoustic Modes in Hypersonic Boundary Layer," Oct 2022 – May 2023.
  - PI, 750,000 ACCESS Credits (100%), Discover ACCESS Request Number: MTH220018, "Devising Scientific Machine Learning Based Methods for Safe Wind Aware Navigation of Small Unmanned Aerial Systems in Urban Spaces," ACCESS is an advanced computing and data resource supported by the National Science Foundation, Oct 6, 2022.
  - Co-PI, $45,000 (33%), OCAST AR20-020, "Next Generation Smart Heatsinks," July 2021-June 2022. Collaborators: Hitesh Vora (OSU) and Aaron Alexander (OSU).
  - Co-PI, $15,994 (50%), Award Number (FAIN): 1925147, Research Experience for Undergraduates (REU) supplement project to employ two Undergraduate RAs for the NSF project, "NRI: INT: Safe Wind-Aware Navigation for Collaborative

Autonomous Aircraft in Low Altitude Airspace REU Supplement," Collaborator: He Bai (OSU)

- PI, $2,796.82 (100%), XSEDE Allocation Request EES210020, "Data-Driven Machine Learning for Safe Wind Aware Navigation of Small UAVs in Urban Spaces," https://xras.xsede.org/public/requests/41777-XSEDE-EES210020
- Co-PI, $1,490,043 (20%), Award Number: 1925147, NSF NRI: INT: Safe Wind-Aware Navigation for Collaborative Autonomous Aircraft in Low Altitude Airspace, 2020-2023. Collaborators: He Bai, Jamey Jacob, Rushikesh Kamalapurkar, Nicoletta Fala, and Samuel Vance.
- PI, $1,618.76 (100%), NASA Oklahoma Space Grant Consortium/NASA EPSCoR, Hypersonic Boundary-Layer Receptivity to Solid Particulates, 2019-2022.
- PI, $390,000.00 (100%), CEAT, 2020-2023.

- Not Accepted Proposals/White Papers
  - White Paper, Not Invited, PI, $598,635.00, Submitted on 09/19/2022, DEPSCoR FOA-AFRL-AFOSR-2022-0006 (AFOSR - Topic 1: Unsteady Aerodynamics and Turbulent Flows), "Large Eddy Simulation of Microfliers to Map Complex Urban Flow Field for Advanced Air Mobility Vehicles," Collaborator: Imraan Faruque (OSU)
  - Unfunded Proposal, PI, $599,932.00, Submitted on 02/22/2022, DEPSCoR/AFOSR (ONR-Topic 14-Hypersonic Aerothermodynamics), "Stabilization of Hypersonic Boundary-Layer using Multifrequency Acoustic Metasurface," Collaborators: James Manimala (OSU), Joseph Jewell (Purdue University), and Ali Er (Western Kentucky University).
  - White Paper, Invited, PI, $596,805.00, White Paper, 09/24/2021, DEPSCoR/AFOSR, ONR-Topic 14 Hypersonic Aerothermodynamics, "Stabilization of Hypersonic Boundary-Layer using Multifrequency Acoustic Metasurface," Collaborators: James Manimala (OSU), and Joseph Jewell (Purdue). Invited on 12/02/21.
  - White Paper, Not Invited, Co-PI, $6,000,000. NASA-ULI, NNH20ZEA001N-ULI, D.4 - University Leadership Initiative (ULI), "Solving Challenges for the Future of Zero Emission Flight." 08/20/2021.
  - White Paper, Not Invited, PI, $1,200,000. Pre-Application to the DOE Office of Science (FOA-0002493: Data-Intensive Scientific Machine Learning and Analysis), "Hybrid Analysis and Modeling for Data-Intensive Scientific Machine Learning."
  - Unfunded Proposal, PI, $600,000 (70%), DEPSCoR / AFOSR, "Acoustic Metasurface for Boundary Layer Stabilization – Hypersonic (AMBuSH)." Collaborators: James Manimala (OSU) and Joseph Jewell (Purdue).

    - White Paper, Invited, PI, DEPSCoR/AFOSR, $600,000 (70%), “Acoustic Metasurface for Hypersonic Boundary-Layer Stabilization,” Collaborators: James Manimala (OSU) and Joseph Jewell (Purdue).
    - White Paper, Not Invited, PI, White paper for the Million Dollar International Quantum U Tech Accelerator announced by the INNOVARE Advancement Center. “Hybrid Quantum-Classical Algorithms for Fluid Dynamics.” 2020. Collaborators: Omer San (OSU) and Prakash Vedula (OU).

- Member of the Executive Committee (NUGEX) of the National Energy Research Scientific Computing (NERSC) Users Group (NUG) (2022 - date)
- Member of the NSF ACCESS Allocation Review Committee (AARC). ACCESS is a cyberinfrastructure program of the National Science Foundation (NSF) for advanced computational resources (2022 – date)
    - Review Panel for Maximize ACCESS, Dec 5, 2022 (3 proposals)
    - Reviewer for Accelerate ACCESS, Dec 14, 2022 (2 proposals)
    - Reviewer for Accelerate ACCESS, Jan 23, 2023 (1 proposal)
- Member of the National Center for Atmospheric Research (NCAR) High-Performance Computing (HPC) User Group (NHUG) (2021 - date)
- Review Panel: DOE, The Office of Advanced Scientific Computing Research (ASCR), Panel Name: Multiscale Mathematics for the Modeling & Simulation of Complex Systems, 03/16/2022 - 03/17/2022
- Member of the following American Institute of Aeronautics and Astronautics (AIAA) technical committees
    - Applied Aerodynamics Technical Committee (2012 – 2021)
    - AIAA APATC Membership Subcommittee (2012 – 2021)
    - AIAA APATC Education Subcommittee (2012 – 2021)
- Technical Co-Chair of AIAA Aviation 2020 Applied Aerodynamics Conference, 15-19 June 2020, A Virtual Event.
- Co-Chair of the 40th AIAA/ASME Symposium, Stillwater, OK, Apr 3, 2021
    - Best Paper Competition Judge, the 40th AIAA/ASME Symposium
    - Arranged the Symposium Speaker, Astronaut Dr. John B. Herrington
    - Organized and run the virtual event on the MS Teams.
- Reviewer in annual AIAA SciTech and Aviation conferences (2012 – date)
    - AIAA Aviation Forum, 12-16 June 2023, San Diego, CA. (7 Papers)
        - Unmanned Systems (6 Papers)
        - Student Paper Competition (1 Paper)
    - AIAA SciTech Forum, 23–27 January 2023, National Harbor, MD. (13 papers)
        - Aerospace Education (2 papers)
        - Applied Aerodynamics (7 papers)
        - Transformational Flight (4 papers)
    - AIAA Aviation Forum, Jun 27–Jul 1 2022, Chicago, IL.
    - AIAA SciTech Forum, 3-7 January 2022, San Diego, CA.
    - AIAA Aviation Forum, 2-6 August 2021, Virtual Event

    - AIAA SciTech Forum, 11-21 January 2021, Virtual E.
    - AIAA Aviation Forum, 15-19 June 2020, Virtual Event
    - AIAA SciTech Forum, 6-10 January 2020, Orlando, FL.
    - AIAA Aviation Forum, 17-21 June 2019, Dallas, TX.

- Session Chair in annual AIAA SciTech and Aviation conferences (2012 – date)
    - 2023 AIAA SciTech, FD-41, Wing-Gust Interactions
    - 2022 AIAA Aviation, APA-58: Applied Aerodynamic General Topics II
    - 2021 AIAA Aviation, APA-41: Airfoil/Wing/Configuration Aerodynamics II
    - 2021 AIAA Aviation, APA-40: Airfoil/Wing/Configuration Aerodynamics I
    - 2021 AIAA SciTech, APA-49, Flow Control Applications II
    - 2021 AIAA SciTech, APA-45, Flow Control Applications I
    - 2020 AIAA Aviation, APA-30: Airfoil/Wing/Configuration Aerodynamics II
    - 2020 AIAA Aviation, APA-12: Applied CFD Modeling and Numerical Corrections with Experimental Data I
    - 2020 AIAA Aviation, APA-05: Aerodynamics Award Lecture
    - 2020 AIAA SciTech, APA-02: Applications of Large-Eddy Simulations
    - 2020 AIAA SciTech, APA-35: Advanced Computational Methods for Aerodynamics III

- Session Chair in Annual Meeting of the APS Division of Fluid Dynamics (2019 – date)
    - 72$^{nd}$ APS DFD, Session Q41: Advances in CFD Algorithms II

- Reviewed two papers for the Modeling, Estimation, and Control Conference, 2021.

- Regular Technical Report Judge in AIAA Design, Build, Fly Competition (2012 – date)
    - Judge: DBF Competition 2022: Letter of Intent/Proposal (6), November 2021
    - Judge: DBF Competition 2022: Technical Report (5), March 2022
    - Judge: DBF Competition 2023: Technical Proposal (5), November 2022

- Committee Chair, AIAA Oklahoma Section Scholarship
    - Three students were awarded out of 99 students.

- Judge, MAE Graduate Research Symposium,
    - Session 2 in ENDV Test Arena (11 posters), Feb 28, 2020
    - Session 3, (6 presentations), Mar 30, 2022

- MAE Senior Design Evaluator
    - Fall 2022, “AI Foosball”
    - Fall 2022, “BB-8 Robot”
    - Spring 2022, “6 Axis Force Balance”
    - Spring 2022, “Mars Simulator for Elementary School Students”
    - Fall 2021, “Quadcopter Testbed”
    - Fall 2021, “Air Sampling and Measurement”
    - Spring 2021, “Wind Turbine Blade Tear Drop Camper.”
    - Spring 2021, “Wind Turbine Blade Slicer.”
    - Spring 2020, “High Altitude Kite.”
    - Spring 2020, “Orange Turbojet Thrust Vectoring (APOP).”

- Member of MAE Aero Curriculum Committee, 2019 – date

- Member of MAE Aero Faculty Search Committee, 2021 – date
    - On campus interview, three candidates, (Fall 2022 – Spring 2023)
    - Online interview, nine candidates (Fall 2022)
    - Online interview, seven candidates (2021)
- Trainings
    - 2022 IT Security Awareness Training (11/01/2022)
    - 2022 Title VII & Title IX Training (11/01/2022)
- Ph.D. Committee Member
    - Suraj Pawar (MAE, Dr. San)
    - Shady E. Ahmed (MAE, Dr. San)
    - Samarjith Biswas (MAE, Dr. Manimala)
    - Kevin Bhar (MAE, Dr. Bai)
    - Muwanika Jdiobe (MAE, Dr. Rouser)
    - Nahid Uzzaman (MAE, Dr. Bai)
- MS Committee Member
    - Harsha Vaddireddy (MAE, Dr. San)
    - Zander Svetgoff (MAE, Dr. Manimala)
    - Kerrick Ray (MAE UAE, Dr. Jacob)
    - Shafi Romeo (MAE, Dr. San)
    - Will Kresl (MAE, Dr. Manimala)
- External Collaborators
    - Frank Gaitan, Ph.D., Quantum Computing Group, Laboratory for Physical Sciences, University of Maryland
    - James A. Kidd, Ph.D., Project Engineer, Integrated Mission Systems / L3Harris Technologies
    - Joseph Jewell, Ph.D., Assistant Professor, Purdue University
    - Dimitri Mavriplis, Ph.D., Professor, University of Wyoming
    - Ali O. Er, Ph.D., Associate Professor, Western Kentucky University
    - Arvind T. Mohan, Ph.D., Scientist, Los Alamos National Laboratory
    - Earl P. N. Duque, Ph.D., Vice President, Intelligent Light LLC.
    - Prakash Vedula, Ph.D., Professor, University of Oklahoma
    - Philip Morris, Ph.D., Professor, Penn State University
    - Vladimir Parezanovic, Ph.D., Assistant Professor, Khalifa University
- Internal Collaborators
    - He Bai, Ph.D., Associate Professor, MAE
    - Jamey Jacob, Ph.D., Professor, MAE
    - Omer San, Ph.D., Associate Professor, MAE
    - James Manimala, Ph.D., Associate Professor, MAE
    - Ryan Paul, Ph.D., Assistant Professor, MAE
    - Kurt Rouser, Ph.D., Assistant Professor, MAE
    - Hitesh Vora, Ph.D., Associate Professor, MET
    - Aaron Alexander, Ph.D., Associate Professor, MET
    - Imraan Faruque, PhD, Assistant Professor, MAE

**Research Scientist, Dec 2018 – Jul 2019**
Department of Mechanical Engineering University of Wyoming, Laramie, WY

- Project: Hover Predictions of Sikorsky S76 Rotor Using a High Order Discontinuous Galerkin Off-Body Discretization.

**Visiting Professor, Jun 2017 – Aug 2017**
Aerospace Engineering Department, The Pennsylvania State University, State College, PA

- Project: Two dimensional Unsteady Reynolds-Averaged Navier-Stokes simulations of a Sweeping Jet Actuator over a 2D-NASA Wall Mounted Hump model for flow separation control.

**Assistant Professor, Jul 2010 – Aug 2018**
Aerospace Engineering Department (ABET Accredited), Khalifa University, Abu Dhabi, UAE

- Khalifa University Faculty Excellence Award for Outstanding Teaching (2014-2015)
- Development of Khalifa University Flow Facilities – $3,500,000.
    - Low-Speed Wind Tunnel (30m x 8m x 4.9m) and Equipment
        - Low speed test section (2.1m x 2.5m x 4m), $V_{max}$ = 20m/s
        - High speed test section (1.2m x 1m x 6m), $V_{max}$ = 70m/s
        - Fully computer-controlled with data acquisition
    - Flow Measurement Equipment: Stereo PIV, Time-Resolved PIV, Mini-Laser Doppler Anemometry, Hot-wire anemometry, Optic Tables, Traverse System, and Force/Moment Balance.
- Graduate Student Advising
    - M.Sc., A. Amro, (2019), Aerodynamic Design of a Gimbal for Surveillance Missions.
    - M.Sc., A. Alnaqbi, (2019), Aerodynamic Design of a Carbon Composite Bicycle Frame.
    - M.Sc., S. Alhameeri, (2019), Structural and Aerodynamic Design of an External Aircraft Pod for Intelligence, Surveillance and Reconnaissance (ISR) Mission
    - Ph.D., B. Slupski, (2019), Sweeping Jet Actuator: An Innovative Approach for Separated Flow Control
- An undergraduate elective course, Computational Fluid Dynamics (CFD), is developed in a Studio Format using a Project-Based Learning approach. The course balanced the theoretical foundation of CFD and hands-on experience. The training was provided using a commercial CFD software, Ansys Fluent. Students worked on a seven-week project, including a proposal, interim reports, final reports, and presentations.
- An undergraduate core course, Aerospace Design Laboratory, is developed in a studio format around four major design projects, including an automated pressure measurement system.
- Developed/Delivered the following undergraduate and graduate courses
    - AERO/MECH 230 Fluid Mechanics I
    - AERO 330 Low-Speed Aerodynamics

- AERO 331 High-Speed Aerodynamics
- AERO 335 Aerodynamics I
- AERO 336 Aerodynamics II
- AERO 380 Aerospace Vehicle Performance
- AERO 391 Undergraduate Research
- AERO 433 Introduction to CFD
- AERO 470 Aerospace Design Laboratory
- AERO 480 & 481 Senior Design Project I & II
- AERO 631 Boundary Layer Analysis
- AERO 703 Numerical Methods in Aero/Fluids
- AERO 704 Selected Topics in Aerospace Engineering (CFD)
- MATH 205 Complex Variables and Transforms
- Advised undergraduate students on Research Projects (KURIF)

- Created the following laboratories, prepared the lab manuals, conducted simulations
  - miniPIV and FlowCoach to Visualize and Analyze Turbulent and Laminar flow ($40,520.35, Spring 2018) in Aerodynamics and CFD courses.
  - AERO 330 – Low-Speed Aerodynamics Lab (Fall 2011)
  - MECH 330 – Fluid Mechanics II Lab(Fall 2011)
  - MECH 440 – Thermodynamics and Heat Transfer Lab (Fall 2012)
  - AERO 433 – Introduction to CFD Lab (Spring-Summer 2014)
  - Purchased\Maintained Ansys Teaching Licenses for AE and ME (50 Tasks) (2011-2018)
  - Purchased\Maintained Ansys Research Licenses (25 Tasks) (2011-2018)
  - Purchased\Maintained Ansys HPC licenses (100 nodes) (2011-2018)

- Supervised the following **Senior Design Projects**
  - "Design and Manufacturing of a UAV for Cloud Seeding Application," Team: A. Alkaabi, H. Alyammahi, M. Alzarooni, S. Alqubaisi, and S. Alzayeoudi, Fall 2017 – Spring 2018.
  - "Design and Fabrication of a Supersonic Wind Tunnel," Team: A. Almehrzi, H. Alnuaimi, M. Alsaadi, M. Alshamsi, and N. AlSuwaidi, Spring 2018 – Fall 2018.
  - "KU CubeSat Phase II – Sponsored by Boeing," Team: N. AlShehhi, H. Saeed, and N. AlAhmed, Fall 2017 – Spring 2018.
  - "Design and Construction of an Aerodynamic Force and Moment Measurement System," Team: H. Alhelo, H. Hassan, S. Al Mansoor, M. Al Khouri, and A. Al Messabi; Aerospace and Mechanical Engineering Senior Students, Spring 2016 – Fall 2016.
  - "Design and Construction of a Solar Car – carbon fiber shell with an aerodynamic shape," Team: S. Alhameeri, S. Almehairi, A. Alshehhi, and N. Al Munthari; Aerospace Engineering Senior Students, Spring 2015 – Fall 2015. The project won 1st place in a National Competition organized by the UAE Ministry of Public Works.
  - "Design and Fabrication of a Supersonic Wind Tunnel," Team: S. Abdalla, B. Krayem, K. Al Nuaimi, A. Al Ali, and N. Al Tamimi; Aerospace and Mechanical Engineering Senior Students, Fall 2014 – Spring 2015.

- "APR1400 Safety Injection Tank Optimization and Design Improvement", Team: M. Alnaqbi, H. Al Ali, S. Alshehhi, H. Alshehhi; Mechanical Engineering Senior Students, Fall 2015 – Spring 2016.

- Some of the Submitted Projects
  - **2018 (PI), Kursat Kara**, Vladimir Parezanovic (Co-PI), Philip J. Morris (I), Andreas Spohn (I), and Omer San (I), "Sweeping Jet Actuator: An Innovative Flow Separation Control Device for Aerodynamic Performance Improvement," Invitation ID: CIRA-2018-39, Duration: 36 months, Budget: AED 2,754,486 ($749,520).
  - **2018 (Co-PI),** Tim McGloughlin (PI) and **Kursat Kara** (Co-PI), "The assessment of the role of calcification and tissue integrity in minimally invasive aortic valve surgery using experimentally reconstructed heart analogs and computational modeling.", Invitation ID: CIRA-2018-50, Duration: 36 months, Budget: AED 2,423,790 ($659,534.7).
  - **2017 (Co-PI)** Abdallah S. Berrouk (KU), Khaled El Bassioni (KU), **Kursat Kara (KU)**, Youssef Marzouk (MIT), Nicholas Hadjiconstantinou (MIT), and Paulo Lozano (MIT), "Multiscale Simulation, Uncertainty Quantification, and Design of Small Spacecraft Reentry Dynamics," KU-MIT Flagship Research Project 4th CFP, Sep 11, 2017, Budget: $3,037,000, Duration: 3 years.

- Funded Projects
  - **2017 (PI)** Abdelnasir Al Naqbi and Kursat Kara, "Computational Aerodynamics Analysis of Composite Bicycle Frames," Aerospace Research and Innovation Centre, Khalifa University, 2017.
  - **2016 (Co-PI)** Daegyoum Kim and Kursat Kara, "Design of fluidic oscillators for active flow control," the Khalifa University of Science Technology and Research - Korea Advanced Institute of Science & Technology (KUSTAR-KAIST) 2016 Seed Money Project.
  - **2016 (PI)** Kursat Kara and Dimitri Kyritsis, "Sweeping Jet Actuator – An Innovative Approach for Separated Flow Control," Khalifa University Internal Research Fund, Level 1, January 2016 - December 2016, and Amount: AED 199,662.
  - **2013 (PI)** Kursat Kara and Wael Zaki, Continuation Award, "Active Load Control of Wind Turbines for Improved Energy Capture at High Wind Speeds," Khalifa University Internal Research Fund, Level 1, February 2013 - December 2013, Amount: AED 125,000.
  - **2012 (PI)** Kursat Kara and Mustafa Emre Gunduz, "Active Load Control of Wind Turbines for Improved Energy Capture at High Wind Speeds," Khalifa University Internal Research Fund, Level 1, February 2012 - December 2012, Amount: AED 199,944.

- Member of the following AIAA committees
  - Applied Aerodynamics Technical Committee (April 2012 – 2021)

- AIAA APATC Membership Subcommittee (2012 – 2021)
- AIAA APATC Education Subcommittee (2012 – 2021)

- Member of the following Khalifa University committees
  - Faculty/Lab Instructor/Lab Engineer Search Committees (2010 - 2018)
  - Graduate Student Interviews (2014 - 2018)
  - High-Performance Computing User Group (2011 -2018 )
  - Undergraduate Curriculum Committee (2012 - 2014)
  - Internship Coordinator of Aerospace Engineering (2014 - 2018)
  - Aerospace Engineering UGCC (2014 - 2018)
  - Library Liaison of Aerospace Engineering (2010 - 2018)
  - Fountain Design Competition Committee

- Advisor of Student Clubs
  - AIAA Design Build and Fly Team (2011 and 2012). Secured funds from Tawazun Holding to support the DBF Team.
  - ASME Chapter (Co-Advisor)

- Organized AIAA Design Build and Fly (DBF) competition trips: (1) to Tucson, AZ, with 11 students in 2011, and (2) to Wichita, KS, with 19 students in 2012.

- Technical Chair of AIAA Aviation 2016 (34th AIAA Applied Aerodynamics Conference)
  - Co-Chairs: Jeremy Pinier from NASA Langley and John Farnsworth from U. Colorado.

- Technical Chair of AIAA SciTech 2018 ASM (Applied Aerodynamics)

- Technical Chair AIAA Aviation 2014 Applied Aerodynamics Conference, 16-20 June 2014 in Atlanta, Georgia.

- Session Chair in AIAA conferences (2012 – date)

- Editor of Journal of Astrophysics and Aerospace Technology

- Regular Reviewer of technical papers for the followings:
  - Physics of Fluids (2018 - )
  - AIAA Journal (2016 - )
  - Finite Elements in Analysis and Design (2016 - )
  - Journal of Ocean Engineering and Science (2016 - )
  - Ain Shams Engineering Journal (2016 - )
  - International Journal of Numerical Methods for Heat and Fluid Flow (2016 - )
  - Waves in Random and Complex Media (2015 - )
  - International Journal of Applied Mechanics (2014 - )
  - Journal of Astrophysics and Aerospace Technology (2013 - )
  - International Journal of Applied Nonlinear Science (2013 - )
  - Journal of Aerospace Engineering (2012 - )
  - Mathematics and Computers in Simulation (2012 - )
  - AIAA Design/Build/Fly Competition Report Judge (2013 - date)

- AIAA Applied Aerodynamics Conferences (2013 – date)
- AIAA Aerospace Sciences Meeting – Applied Aerodynamics (2013 – date)
- AIAA Aerospace Sciences Meeting – Atmospheric Flight Mechanics (2013)
- 2012, ASME Power Conference / 20th International Conference on Nuclear Engineering
- 2013 IEEE 5th International Conference on Engineering Education
- 2012 IEEE International Conference on Power and Energy
- 2012, AIAA Report Review: A Best Practices Report on CFD Education in the Undergraduate Curriculum
- 2012, Book Review: Russ Cummings - Applied Computational Aerodynamics

- Organized the following seminars
  - Abbass Karim, Fluid Codes LLC, "ANSYS Engineering Simulation Solutions," Apr 2, 2012.
  - Ravi Samtaney, KAUST, "The Role of Advanced Algorithms and Simulations in Plasma Science," Feb 26, 2012.
  - Don Winter, Vice President, Flight and Systems Technologies, Boeing Research & Technology, "The Globalization of Aerospace Research and Development," Jan 11, 2011.

- Certificates and Awards
  - CITI - Responsible Conduct of Research for Engineers, Expires on Oct 23, 2019
  - CITI - Information Privacy Security – Researchers (IPS), Expires on Oct 23, 2019
  - CITI - Information Privacy Security – Instructors (IPS), Expires on Oct 23, 2019
  - CITI - Conflicts of Interest, Expires on Oct 23, 2019
  - Certificate of Appreciation for Advising AIAA Design/Build/Fly Team, Aerospace Engineering Department, 2011
  - Achievement Award for Advising AIAA Design/Build/Fly Team, Aerospace Engineering Department, 2012
  - Certificate of Training for ABET Engineering Professional Skills Assessment, Sep 2015.

**Post-Doctoral Scholar, Aug 2009 – Aug 2010**
Aerospace Engineering Department, The Pennsylvania State University, State College, PA

- Supervisor: Dr. Philip J. Morris
- Project: Large Eddy Simulations of Hot Supersonic Jets for Aeroacoustics
  DOD-Navy-STTR-Contract Number: N68335-09-C-0370, $69,968
  - Created a software tool for the US Navy to better design and engineer nozzle components and noise attenuation technologies for low-bypass ratio power plants of modern tactical aircraft.
  - Created Hybrid RANS/LES simulation of three-dimensional shock-containing jet plumes.
  - Developed three-dimensional Compressible High Order Parallel Acoustics (CHOPA) code.
  - Created validation cases such as Gaussian pressure pulse, turbulent flat plate, etc.

**Instructor, May 2010 – July 2010**
Aerospace Engineering Department, The Pennsylvania State University, State College, PA

- AERSP 312 Aerospace Analysis

**CFD/Aerospace Engineer, Nov 2008– Jun 2009**
New England Analytics, LLC, Shelton, CT, (Consulting Company to Sikorsky Aircraft Corp.)

- Performed flight simulations using GENHEL for Sikorsky S70B Seahawk Helicopter to satisfy the conditions described in FAA Advisory Circular 120-63 Helicopter Simulator Qualification.
- Contributed to developing a landing/take-off estimation model using sensor measurement data based on flight dynamics equations. Tested the model in Matlab.
- Generated three-dimensional computational grid for subsonic viscous flows around Unmanned Air Vehicle from Catia CAD model using Gridgen and ICEM CFD.
- Simulated and analyzed the flow field around Unmanned Air Vehicle and computed variations of aerodynamic parameters concerning the angle of attack using ANSYS Fluent.
- Participated in writing SBIR/STTR Phase I research proposals to the US Department of Defense. Some of the topics are "Army: Hybrid Vorticity Transport Method for Rotorcraft Comprehensive Analysis," "Navy: V-22 Three-Dimensional (3D) Downwash Measurement", and "Navy: Rotor Wake Computations for Direct Integration with Current CFD Technology."

**Graduate Research Assistant, Aug 2003 – Dec 2008**
Aerospace Engineering Department, Old Dominion University, Norfolk, VA
(Supported by NASA Langley Research Center)

- Ph.D. work appeared in "High-End Computing at NASA, Highlights of science and engineering achievements on NASA's supercomputers, 2007-2008."
- Developed high order accurate, steady, unsteady, compressible full Navier-Stokes flow solver employing 5th order accurate weighted essentially non-oscillatory (WENO) scheme for spatial discretization and 3rd order accurate total variation diminishing (TVD) Runge-Kutta scheme for temporal integration.
- The WENO solver was coded using FORTRAN, paralleled using Message Passing Interface (MPI) routines, and run on a high-performance computing cluster.
- Results of the WENO solver were validated against wind tunnel data and theoretical results.
- Steady and unsteady, supersonic and hypersonic flows around cone and wedge geometries were computed.
- Hypersonic boundary layer stability characteristics were computed via Linear Stability Analysis.
- Receptivity processes of hypersonic boundary layers due to slow and fast mode acoustic disturbances were computed for different geometries and conditions.

- Laminar to turbulent flow transition locations were predicted using the developed code for different geometries and flow conditions.

**Graduate Research and Teaching Assistant, Aug 2000 – Jul 2003**
Aeronautical Engineering Department, Istanbul Technical University, Turkey

- Developed a physics-based three-dimensional unsteady flow solver using the vortex element method. The solver was coded with FORTRAN and paralleled with MPI.
- Simulated and analyzed three-dimensional unsteady separated flow around circular cylinders and a sphere.
- Teaching assistant for the following courses.
    - AE322 Thermodynamics Fall 2002
    - AE351 Aerodynamics Spring 2002
    - AE 202E Numerical Methods Fall 2001

## WORKSHOPS & SHORT COURSES

- High-Order Methods and High-Fidelity Flow Simulations Workshop, Nov 6-7, 2006, National Institute of Aerospace, Hampton, VA
- Short Course on the Fundamentals of Hypersonic Flight Sep 10, 2007, National Institute of Aerospace, Hampton, VA

## SKILLS

- **Programming:**
  Julia, Python, Fortran, MPI, Visual BASIC, VBA for MS Excel, Pascal.
- **Operating Systems**
  Windows, Linux, Mac
- **Engineering Software**
  Fluent, CFX, Comsol, ANSYS, Gridgen, ICEM CFD, Gambit, Labview.
- **CAD Software**
  SolidWorks, Catia v5, AutoCAD, I-DEAS (Master Modeler).
- **Math and Visualization**
  Mathematica, MathCAD, Matlab, Maple, VisIt, Vapor, Tecplot, Grapher, Surfer.

## SCHOLARSHIPS & AWARDS

**Faculty Excellence Award for Outstanding Teaching, (2014-2015)**
Awarded by the President of Khalifa University, Abu Dhabi, UAE

**Doctoral Dissertation Fellowship Award, 2008**
Awarded by Department of Aerospace Engineering, Old Dominion University. Norfolk, VA

**Graduate Research Assistantship, 2003 – 2008**
Awarded by Department of Aerospace Engineering, Old Dominion University. Norfolk, VA

**Tuition Exemption Award, Summer 2007**
Awarded by the President's Office, Old Dominion University, Norfolk, VA

**Graduate Research and Teaching Assistantship, 2000 - 2003**
Awarded by Department of Aeronautical Engineering, Istanbul Technical University, Turkey

## OTHER EXPERIENCE

- Computer Laboratory Administrator, Istanbul Technical University 1997 – 1998
  Aeronautical Engineering Department, administrated undergraduate computer laboratory. (60 WinNT Computer)
- Internship, Helicopter Maintenance Factory, Ankara, Turkey Summer 1998
  Attended maintenance and engine tests of Bell UH-1H, AH-1P/S Cobra.
- Internship, ITU Manufacturing, and Maintenance Workshop, Turkey Summer 1996
  Hands-on experience in manufacturing methods, such as lathing, welding, and milling.

## PROFESSIONAL AFFILIATIONS

- AIAA (Senior Member)
- APS (Member)
- ASME (Member)

## PEER-REVIEWED ARCHIVAL JOURNAL AND TRANSACTIONS PAPERS

(The highlight indicates the student supervised in Kara's group)

**24.** Mobashera Alam and Kursat Kara, "Analysis of High-Frequency Jet Oscillation using Dynamic Mode Decomposition with Improved Eigenvalue-Based Mode Selection Algorithm." AIP Advances, Under review, Submitted on Dec 16, 2022, ADV22-AR-03512.

**23.** Furkan Oz and Kursat Kara. "Efficient Implementation of Quantum PDE Solver with Chebyshev Points." Quantum Information Processing, Under review, Submitted on Jun 3, 2022, QINP-D-22-00428.

**22.** Furkan Oz, Thomas Goebel, Joseph Jewell and Kursat Kara. "Local Wall Cooling Effects on Hypersonic Boundary-Layer Stability." Journal of Spacecraft and Rockets, Articles in Advance, Oct 27 2022, 10.2514/1.A35404.

**21.** Rohit K. S. S. Vuppala and Kursat Kara. "A non-intrusive reduced order model using deep learning for realistic wind data generation for small unmanned aerial systems in urban spaces." AIP Advances, 12, 085020 (2022); 10.1063/5.0098835.

**20.** Mobashera Alam and Kursat Kara, "The Influence of Exit Nozzle Geometry on Sweeping Jet Actuator Performance." Fluids, 2022, 7, no. 2:69, 10.3390/fluids7020069.

**19.** Furkan Oz, Rohit K. S. S. Vuppala, Kursat Kara and Frank Gaitan. "Solving Burgers' Equation with Quantum Computing." Quantum Information Processing, 21, 30 (2022). 10.1007/s11128-021-03391-8

**18.** Asma Tabassum, Rohit K. S. S. Vuppala, He Bai, and Kursat Kara. "Variance Reduction of Quadcopter Trajectory Tracking in Turbulent Wind." IFAC-PapersOnLine, Volume 54, Issue 20, 2021, Pages 102-107, 10.1016/j.ifacol.2021.11.160

**17.** Furkan Oz and Kara, Kursat, "A CFD Tutorial in Julia: Introduction to Compressible Laminar Boundary-Layer Flows." Fluids, 2021, 6, 400, 10.3390/fluids6110400

**16.** Furkan Oz and Kursat Kara, "A CFD Tutorial in Julia: Introduction to Laminar Boundary-Layer Theory." Fluids, 2021, 6, 207, 10.3390/fluids6060207

**15.** Abdul Raouf Tajik, Kursat Kara, Vladimir Parezanovic. "Sensitivity of a fluidic oscillator to modifications of feedback channel and mixing chamber geometry." Experiments in Fluids, 62, 250 (2021). 10.1007/s00348-021-03342-0

**14.** Ahmed, Shady E., Omer San, Kursat Kara, Rami Younis, and Adil Rasheed. "Multifidelity computing for coupling full and reduced order models." Plos One, 16, no. 2 (2021): e0246092, 10.1371/journal.pone.0246092

**13.** Ahmed, Shady E., Omer San, Kursat Kara, Rami Younis, and Adil Rasheed. "Interface learning of multiphysics and multiscale systems." Physical Review E, 102, no. 5 (2020): 053304, 10.1103/PhysRevE.102.053304

**12.** Furkan Oz and Kursat Kara, "Jet Oscillation Frequency Characterization of a Sweeping Jet Actuator." Fluids, 2020, 5, no. 2: 72, 10.3390/fluids5020072

**11.** Kursat Kara, Ashraf Al-Khateeb, and Eiyad Abu-Nada, "On the assessment of modeling combined convection heat transfer in nanofluids using dissipative particle dynamics," International Journal of Mechanical Sciences, Volume 150, January 2019, Pages 561-575, 10.1016/j.ijmecsci.2018.10.062, Impact Factor: 4.134.

**10.** Bartosz J. Slupski, Abdul Raouf Tajik, Vladimir B. Parezanović, Kursat Kara, "On the Impact of Geometry Scaling and Mass Flow Rate on the Frequency of a Sweeping Jet Actuator," FME Transactions, 2019, Vol 47, No 3, pages 599-607, 10.5937/fmet1903599S, Impact Factor: 1.37.

**9.** Kursat Kara, Daegyoum Kim, and Philip J. Morris, "Flow-Separation Control Using Sweeping Jet Actuator," AIAA Journal, Volume 56, Number 11, November 2018, 10.2514/1.J056715, Impact Factor: 2.72.

**8.** Tongil Park, Kursat Kara, and Daegyoum Kim, "Flow structure and heat transfer of a sweeping jet impinging on a flat wall," International Journal of Heat and Mass Transfer, Volume 124, September 2018, pages 920-928, 10.1016/j.ijheatmasstransfer.2018.04.016, Impact Factor: 4.346.

**7.** Bartosz J. Slupski and Kursat Kara. "COANDA SURFACE EFFECT ON THE SWEEPING JET ACTUATOR," Journal of Aeronautics and Space Technologies, 2018; Vol 11, No 1, pages 29-43, link.

**6.** Omer San and Kursat Kara, "Evaluation of Riemann flux solvers for WENO reconstruction schemes: Kelvin-Helmholtz instability," Computers & Fluids, Volume 117, Aug 31, 2015, Pages 24–41. link, Impact Factor: 2.223

**5.** Omer San and Kursat Kara, "Numerical assessments of high-order accurate shock-capturing schemes: Kelvin-Helmholtz type vortical structures in high-resolution," Computers & Fluids, Volume 89, Jan 20, 2014, Pages 254–276, link, Impact Factor: 2.223

**4.** Kursat Kara, Ponnampalam Balakumar, and Osama A. Kandil. "Effects of Nose Bluntness on Hypersonic Boundary-Layer Receptivity and Stability over Cones," AIAA Journal, Vol. 49, No. 12 (2011), pp. 2593-2606. link, Impact Factor: 2.72.

**3.** Omer San and Kursat Kara, "High-Order Accurate Spectral Difference Method for Shallow Water Equations," International Journal of Research and Reviews in Applied Sciences, Vol. 6 No. 1, January 2011, 41-54. link.

**2.** Omer San and Kursat Kara, "A Multi-grid Accelerated High-Order Compact Fractional-Step Method for Unsteady Incompressible Viscous Flows," International Journal of Research and Reviews in Applied Sciences, Vol. 5, No. 3, December 2010, 245-259. link

**1.** Philip J. Morris, Yongle Du, and Kursat Kara, "Jet Noise Simulations for Realistic Jet Nozzle Geometries," IUTAM Symposium on Computational Aero-Acoustics for Aircraft Noise, Procedia Engineering, Volume 6, 2010, Pages 28–37, link.

Also appeared as:

Philip J. Morris, Yongle Du, and Kursat Kara, "Reprint of Jet Noise Simulations for Realistic Jet Nozzle Geometries," IUTAM Symposium on Computational Aero-Acoustics for Aircraft Noise, IUTAM, Volume 1, 2010, Pages 28–37, link.

## PEER-REVIEWED CONFERENCE PROCEEDINGS PAPERS

(Presenter's name is underlined. The highlight indicates the student supervised in Kara's group)

**33.** Furkan Oz and Kursat Kara, "Hypersonic Boundary-Layer Stability Over a Wedge with Combined Local Cooling and Local Metasurface Treatment," AIAA Aviation Forum 2023, Jun 12 - Jun 16 2023, San Diego, California, Accepted.

**32.** Shafi Romeo, Furkan Oz, Tuyen Nguyen, Kursat Kara, and Omer San, "Reinforcement learning closures for Galerkin projection models," AIAA Aviation Forum 2023, Jun 12 - Jun 16 2023, San Diego, California, Accepted.

**31.** Rohit Vuppala and Kursat Kara, "Physics based Machine Learning models for wind-field prediction in Urban Spaces for small Unmanned Aerial Systems," AIAA Aviation Forum 2023, Jun 12 - Jun 16 2023, San Diego, California, Accepted.

**30.** Rohit Vuppala, Braydon Revard, Jamey Jacob, and Kursat Kara, "Wind Field Prediction in Urban Spaces using Machine Learning based Reduced Order Models for Unmanned Aerial Systems," 103rd American Meteorological Society Annual Meeting (Special Symposium on Urban Environment), 8 to Jan 12 2023 in Denver, Colorado. Paper: 421680.

**29.** Caleb Robb, Rohit Vuppala, Ryan C. Paul and Kursat Kara, "Flight Dynamics of a Flying Wing Aircraft Featuring the Bell Spanload," AIAA SciTech Forum 2023, 23–27 January 2023, National Harbor, MD, AIAA 2023-2610, 10.2514/6.2023-2610

**28.** Rohit Vuppala and Kursat Kara, "Deep Learning for Realistic Wind Field Prediction in Various Urban Morphologies for Application to Small Unmanned Aerial Systems," AIAA SciTech Forum 2023, 23–27 January 2023, National Harbor, MD, AIAA 2023-1757, 10.2514/6.2023-1757

**27.** Furkan Oz and Kursat Kara, "Hypersonic Boundary-Layer Stability with Cooling Strip and Metasurface," AIAA SciTech Forum 2023, 23–27 January 2023, National Harbor, MD, AIAA 2023-0818, 10.2514/6.2023-0818

**26.** Mobashera Alam, Kursat Kara, and Aaron Alexander, "Reduction of Spanwise Flow Over a Swept Wing using an Air Curtain Produced by Rectangular Slot," AIAA AVIATION Forum, Jun 27 – Jul 1 2022, Chicago, IL, AIAA 2022-3296, 10.2514/6.2022-3296

**25.** Rohit Vuppala and Kursat Kara, "Wind Field Prediction in Urban Spaces for small Unmanned Aerial Systems using Convolutional Autoencoders," AIAA AVIATION Forum, Jun 27 – Jul 1 2022, Chicago, IL, AIAA 2022-3605, 10.2514/6.2022-3605

**24.** Tyler Landua, Rohit Vuppala, and Kursat Kara, "Investigation of Airflow around Buildings using Large Eddy Simulations for Unmanned Air Systems Applications," AIAA SciTech 2022 Forum, AIAA 2022-1688, 10.2514/6.2022-1688

**23**. Asma Tabassum, Rohit K. S. S. Vuppala, He Bai, and Kursat Kara, "Variance Reduction of Quadcopter Trajectory Tracking in Turbulent Wind," Modeling, Estimation, and Control Conference MECC 2021 Austin, Texas, USA, 24-27 October 2021.

**22.** Rohit Vuppala and Kursat Kara, "A Novel Approach in Realistic Wind Data Generation for The Safe Operation of Small Unmanned Aerial Systems in Urban Environment," AIAA AVIATION Forum 2021, Applied Aerodynamics, 2-6 August 2021, Virtual Event, Washington, DC, AIAA, DOI: 10.2514/6.2021-2505.

**21.** Furkan Oz and Kursat Kara, "Effects of Local Cooling on Hypersonic Boundary-Layer Stability," AIAA SciTech 2021 Forum, 11–15 & 19–21 January 2021, Virtual Event, AIAA 2021-0940

**20.** S. M. Al-Ali, K. Kara; A. N. Al-Khateeb, "Aerodynamic Optimization of an Aerial Pod," 2020 Advances in Science and Engineering Technology International Conferences (ASET), 4 Feb.-9 April 2020, Dubai, UAE, DOI: 10.1109/ASET48392.2020.9118171.

**19.** S. Z. Al Hemeiri, S. Balawi, K. Kara; A. N. Al-Khateeb, "In-Plane Moduli of Elasticity Homogenization of Arc-Tan Corrugation," 2020 Advances in Science and Engineering Technology International Conferences (ASET), 4 Feb.-9 April 2020, Dubai, UAE, DOI: 10.1109/ASET48392.2020.9118177.

**18.** A. B. Amro, K. Kara, and D. Kyritsis, "Computational Fluid Dynamics Study for Drag Reduction of an Airborne Surveillance Gimbal," 2020 IEEE Aerospace Conference, Big Sky, MT, USA, 2020, pp. 1-16, 10.1109/AERO47225.2020.9172432.

**17.** Kursat Kara, Andrew C. Kirby, and Dimitri J. Mavriplis, "Hover Predictions Using a High-Order Discontinuous Galerkin Off-Body Discretization," AIAA SciTech 2020 Forum, 6-10 January 2020, Orlando, FL, AIAA 2020-0771

**16.** Bartosz J. Slupski, Kursat Kara, Vladimir Parezanovic and Dimitrios Kyritsis, "Experimental Inner Pressure Analysis of a Sweeping Jet Actuator," AIAA AVIATION 2018 Applied Aerodynamics Conference, 25-29 June 2018, Atlanta, GA, 2018-3337.

**15.** Kursat Kara, "Flow Separation Control using Sweeping Jet Actuator," AIAA 35th Applied Aerodynamics Conference, Denver, Colorado, USA, 5-9 June 2017, 2017-3041

**14.** Bartosz J. Slupski and Kursat Kara. "Separated Flow Control over NACA 0012 Airfoil Using Sweeping Jet Actuators", AIAA 35th Applied Aerodynamics Conference, Denver, Colorado, USA, 5-9 June 2017, 2017-3043

**13.** Bartosz J. Slupski and Kursat Kara. "Effects of Feedback Channels and Coanda Surfaces on the Performance of Sweeping Jet Actuator," AIAA 55th Aerospace Sciences Meeting, AIAA SciTech Forum, 2017-0488

**12.** Ali M. Anttho, Bartosz J. Slupski, Abdullah Mohiudeen, and Kursat Kara, "Determination of Water Droplet Collection Efficiency: An Empirical Model," AIAA Atmospheric Flight Mechanics Conference, AIAA SciTech Forum, 2017-1869

**11.** Bartosz J Slupski, Kursat Kara, "Design of a Sweeping Jet Actuator for Improved Aerodynamic Performance," Proceedings of the 3rd International Aviation Management Conference, IAMC 2016, DUBAI, UAE, 23-24 November 2016. link

**10.** Bartosz J. Slupski and Kursat Kara, "Internal Mass Flow Rate Analysis of the Sweeping Jet Actuator," ICAYS 2016, International Conference in Aerospace for Young Scientist, Nov. 12-13, 2016, Beijing, China.

**9.** Kursat Kara, "Numerical Simulation of a Sweeping Jet Actuator," AIAA Aviation 2016, AIAA 34th Applied Aerodynamics Conference, June 13-17, 2016, Washington DC, USA. 2016-3261.

**8.** Bartosz J. Slupski and Kursat Kara, "Effects of Geometric Parameters on Performance of Sweeping Jet Actuator," AIAA Aviation 2016, AIAA 34th Applied Aerodynamics Conference, June 13-17, 2016, Washington DC, USA. 2016-3263

**7.** Kursat Kara, "Numerical Study of the Internal Flow Structures Inside the Sweeping Jet Actuator," AIAA Aviation 2015, AIAA 33rd Applied Aerodynamics Conference, June 22-26, 2015, Dallas, Texas, USA. 2015-2424.

**6.** Kursat Kara, "Effects of a Porous Coating on Hypersonic Boundary. Layer Receptivity over a Cone", IEEE/AIAA 6th Conference on Recent Advances in Space Technology, 12-14 June 2013, Istanbul, Turkey. Link.

**5.** Kursat Kara, Mustafa E. Gunduz, Jee Wong Kim, and Lakshmi Sankar, "Effects of Circulation Control on Power Production for Large-Scale Wind Turbines," AIAA 51st Aerospace Sciences Meeting, January 7-10, 2013, Grapevine, Texas, USA. 2013-1105.

**4.** Kursat Kara, Ponnampalam Balakumar, and Osama Kandil, "Effects of Wall Cooling on Hypersonic Boundary Layer Receptivity over a Cone." AIAA 38th Fluid Dynamics Conference and Exhibit: 2008-3734.

**3.** Kursat Kara, Ponnampalam Balakumar, and Osama Kandil, "Effects of Nose Bluntness on Stability of Hypersonic Boundary Layers over a Blunt Cone." AIAA 37th Fluid Dynamics Conference and Exhibit, 2007-4492.

**2.** K. Kara, P. Balakumar, and O. A. Kandil, "Receptivity of Hypersonic Boundary Layers Due to Acoustic Disturbances Over Blunt Cone." AIAA 45th Aerospace Sciences Meeting and Exhibit, 2007-945.

**1.** Wael Mokhtar, Ilteris Koc, Xu Zheng, and Kursat Kara, "Aerodynamics and Flow Control of Flapping Wings." AIAA 44th Aerospace Sciences Meeting and Exhibit, 2006-1059.

## ABSTRACT REVIEWED CONFERENCE PAPERS

(Presenter's name is underlined. The highlight indicates student supervised in Kara's group)

**35.** Rohit Vuppala, and Kursat Kara, "Machine Learning based Reduced Order Modeling for Wind Field Prediction in Urban Spaces for Unmanned Aerial Systems," MAE Graduate Research Symposium, Mar 24, 2023, Stillwater, OK.

**34.** Peyton Pierson, Furkan Oz, and Kursat Kara, "Blunt reentry vehicle reinforcement learning model with adaptive mesh refinement to reduce computational load," MAE Graduate Research Symposium, Mar 24, 2023, Stillwater, OK.

**33.** Serge Amangoua, Rohit Vuppala, and Kursat Kara, "Investigating urban wind fields using high resolution simulations for Unmanned Aerial Systems applications," MAE Graduate Research Symposium, Mar 24, 2023, Stillwater, OK.

**32.** Tuyen Nguyen, Furkan Oz, and Kursat Kara, "Dynamic Stability Analysis of the Orion Capsule at Transonic Speed," MAE Graduate Research Symposium, Mar 24, 2023, Stillwater, OK.

**31.** Furkan Oz and Kursat Kara, "Quantum PDE Solver with Chebyshev Points," MAE Graduate Research Symposium, Mar 24, 2023, Stillwater, OK.

**30.** Jamey D Jacob, Brian R Elbing and Kursat Kara, "Micro Flyer Requirements for Urban Wind Field Observations," 75th Annual Meeting of the APS Division of Fluid Dynamics, November 20-22, 2022, Indianapolis, IN.

**29.** Tuyen Nguyen, Furkan Oz, and Kursat Kara, "Dynamic Stability of the Mars Science Laboratory Entry Vehicle in Supersonic Flow," 75th Annual Meeting of the APS Division of Fluid Dynamics, November 20-22, 2022, Indianapolis, IN.

**28.** Isaiah Richmond, Mobashera Alam, and Kursat Kara, "Numerical Simulation of an Atmospheric Entry Vehicle at Subsonic Speeds for Dynamic Stability," 75th Annual Meeting of the APS Division of Fluid Dynamics, November 20-22, 2022, Indianapolis, IN.

**27.** Furkan Oz and Kursat Kara, "Hypersonic Boundary Layer Stability of Local Cooling Strip and Porous Surface," 75th Annual Meeting of the APS Division of Fluid Dynamics, November 20-22, 2022, Indianapolis, IN.

**26.** Rohit Vuppala and Kursat Kara, "Physics Informed Neural Network model for wind field prediction in urban spaces for small Unmanned Aerial Systems," 75th Annual Meeting of the APS Division of Fluid Dynamics, November 20-22, 2022, Indianapolis, IN.

**25.** Mobashera Alam and Kursat Kara, "Characterization of Sweeping Jet Actuator Flow Field using DMD analysis," 75th Annual Meeting of the APS Division of Fluid Dynamics, November 20-22, 2022, Indianapolis, IN.

**24.** Rohit Vuppala, Tyler Landua, and Kursat Kara, "Machine Learning for Wind-Aware sUAS in Urban Spaces," NSF EPSCoR Workshop Artificial Intelligence (AI) with No-Boundary Thinking (NBT), Apr 4, 2022, Little Rock, AR

**23.** Thomas E. Goebel, Furkan Oz, and Kursat Kara, "Hypersonic Boundary-Layer Stability Analysis for Local Wall Cooling," MAE Graduate Research Symposium, Mar 30, 2022, Stillwater, OK, link

**22.** Tuyen Nguyen, Furkan Oz, and Kursat Kara, "Computational Flow Analysis of 2D Wedge from Subsonic to Hypersonic Speeds," MAE Graduate Research Symposium, Mar 30, 2022, Stillwater, OK, link

**21.** Furkan Oz and Kursat Kara, "Application of the Quantum Computing for Heat and Burgers' Equations," MAE Graduate Research Symposium, Mar 30, 2022, Stillwater, OK, link

**20.** Mobashera Alam, Michael T. Cuthbertson, Trevor Marshall, Isaiah Richmond, Kaitlyn Matic and Kursat Kara, "Characterization of Sweeping Jet Actuator Flow Field using DMD Analysis," MAE Graduate Research Symposium, Mar 30, 2022, Stillwater, OK, link

**19.** Rohit Vuppala and Kursat Kara, "Wind Prediction for the safe operation of small Unmanned Aerial Systems using Machine Learning," MAE Graduate Research Symposium, Mar 30, 2022, Stillwater, OK, link

**18.** Furkan Oz, Evan R. Evans, Thomas E. Goebel, Kursat Kara, James M. Manimala, and Joseph S. Jewell, "Interaction of Ultrasonic Acoustic Waves and Metasurface Structures for Hypersonic Boundary-Layer Stability Applications," 74th Annual Meeting of the APS Division of Fluid Dynamics, November 21-23, 2021, Phoenix, AZ. link

**17.** Mobashera Alam, Trevor Marshall, and Kursat Kara, "Effects of Exit Nozzle Geometric Parameters on Sweeping Jet Actuator Performance," 74th Annual Meeting of the APS Division of Fluid Dynamics, November 21-23, 2021, Phoenix, AZ. link

**16.** Rohit Vuppala and Kursat Kara, "Realistic Wind Data Generation for Small Unmanned Air Systems in Urban Environment using Convolutional Autoencoders," 74th Annual Meeting of the APS Division of Fluid Dynamics, November 21-23, 2021, Phoenix, AZ. link

**15.** Furkan Oz and Kursat Kara, "Stabilization of the Acoustic Mack Modes with Metasurface," 40th ASME/AIAA Online Regional Symposium, Saturday, Apr 3, 2021; Stillwater, OK. link

**14.** Tyler Landua, Rohit Vuppala, and Kursat Kara, "Large-Eddy Simulation Around Buildings in Crosswinds for Unmanned Air Systems," 40th ASME/AIAA Online Regional Symposium, Saturday, Apr 3, 2021; Stillwater, OK. link

**13.** Rohit Vuppala and Kursat Kara, "A Machine Learning Approach to Predict Wind Field Data," 40th ASME/AIAA Online Regional Symposium, Saturday, Apr 3, 2021; Stillwater, OK. link

**12.** Shadi Ahmed, Omer San, Kursat Kara, Rami Younis, and Adil Rasheed, "Interface learning for coupling full and reduced order models in multifidelity simulations," 40th ASME/AIAA Online Regional Symposium, Saturday, Apr 3, 2021; Stillwater, OK. link, Best Paper Award

**11.** Mobashera Alam and Kursat Kara, "Sweeping Jet Actuator (SWJA) in Water," 40th ASME/AIAA Online Regional Symposium, Saturday, Apr 3, 2021; Stillwater, OK. link

**10.** Rohit Vuppala and Kursat Kara, "Large-Eddy Simulation of Atmospheric Boundary-Layer Gusts for Small Unmanned Air Systems," 73rd Annual Meeting of the APS Division of Fluid Dynamics, Sunday–Tuesday, November 22–24, 2020; Virtual, CT (Chicago time). link

**9.** Furkan Oz and Kursat Kara, "Effects of Local Wall Cooling on Hypersonic Boundary-Layer Stability on a Blunt Cone," 73rd Annual Meeting of the APS Division of Fluid Dynamics, Sunday–Tuesday, November 22–24, 2020; Virtual, CT (Chicago time). link

**8.** Furkan Oz and Kursat Kara, "Towards exascale DNS solver for hypersonic boundary-layer receptivity to solid particulates," OSU - Coalition for Advancing Digital Research & Education (CADRE) Conference, Apr 17, 2020, Stillwater, OK. https://hdl.handle.net/11244/324829

**7.** Furkan Oz and Kursat Kara, "Hypersonic Boundary-Layer Receptivity to Solid Particulates," MAE Graduate Research Symposium, Feb 28, 2020, Stillwater, OK.

**6.** Kursat Kara, Michael Brazell, Andrew Kirby, Earl Duque, and Dimitri Mavriplis, "Hover Predictions Using a High-Order Discontinuous Galerkin Off-Body Discretization," 72nd Annual Meeting of the APS Division of Fluid Dynamics, Volume 64, Number 13, Saturday–Tuesday, November 23–26, 2019; Seattle, WA, link

**5.** Park, Tongil; Kara, Kursat; Kim, Daegyoum, "Sweeping jet for convective heat transfer of a flat plate," 70th Annual APS DFD Meeting, American Physical Society, 2017-11-19, link

**4.** Park, T., Kara, K., Kim, D., "Flow structure and heat transfer of sweeping jet impingement," 12th International Symposium on Particle Image Velocimetry, 2017-06-20, Publisher: The Korean Society of Visualization, link

**3.** Bartosz J. Slupski and Kursat Kara, "Orientation Study of the Sweeping Jet Actuator over the NACA 0015," ICAYS 2017, International Conference in Aerospace for Young Scientist, Sep. 7-8, 2017, Beijing, P. R. China.

**2.** Mustafa Gunduz and Kursat Kara, "Research at Khalifa University towards Active Flow Control of Wind Turbines," 2nd International Conference on Renewable Energy: Generation and Applications, March 4-7, 2012, Al Ain, UAE.

**1.** K. Kara and M. F. Unal, "Simulation and Analysis of Three-Dimensional Separated Flow around Sphere and Circular Cylinder." AIAA Region I-MA Student Conference, Pennsylvania State University, April 7-8, 2006.

## SEMINARS AND PRESENTATIONS

**12.** Kursat Kara, "The role of computational aerodynamics in the design of missiles," Tawazun Dynamics, Mar 16, 2017.

**11.** Kursat Kara, "Design and Analysis of cruise missiles and surveillance pods using CFD," ETIC, Emirates Advanced Research and Technology Holding, 2017.

**10.** Kursat Kara, "Challenges of Computational Aerodynamics: Flow Separation Control to Hypersonic Boundary Layer Transition," Department of Mechanical Engineering, Korea Advanced Institute of Science & Technology (KAIST), Daejeon, Republic of Korea, Oct 5, 2016, *Invited Seminar*.

**9.** Kursat Kara, "Numerical Study of the Internal Flow Structures Inside the Sweeping Jet Actuator," AIAA Aviation 2015, FDTC/MSTC 1st Flow Visualization Event, June 22-26, 2015, Dallas, Texas, USA.

**8.** Kursat Kara, "Computational Fluid Dynamics: Application to Real-World Problems," Knowledge Sharing Program, Dec 17, 2014, Takreer Research Center, Abu Dhabi, UAE.

**7.** Kursat Kara and Majid Siddiqi, "Classical Aerodynamics meets with Applied Aerodynamics," 2nd ANSYS User Meeting Conference, Nov 5, 2014, Le Royal Méridien Hotel, Abu Dhabi, UAE.

**6.** K. Kara and M. Siddiqi, "Teaching Aerodynamics at Khalifa University," ANSYS User Meeting Conference, Nov 7, 2013, Radisson Blu Hotel, Dubai Creek, Dubai, UAE.

**5.** Kursat Kara, "Challenges of Hypersonic Flight - Boundary Layer Transition," School of Aerospace Engineering, Georgia Tech, Atlanta, GA, Jun 21, 2012. *Invited Seminar*

**4.** Kursat Kara, "Challenges in Hypersonic Boundary Layers," American University of Sharjah, Sharjah, UAE,May 10, 2012. *Invited Seminar*

**3.** Kursat Kara, "Laminar to Turbulent Transition in Hypersonic Boundary Layers," King Abdullah University of Science and Technology, Thuwal, Kingdom of Saudi Arabia, Mar 18, 2012. *Invited Seminar*

**2.** M. Muneer Humood and Kursat Kara, "Active Control of Flow Separation for Wind Turbines," Poster ID: U-01, The 2nd International Conference on Renewable Energy: Generation and Applications, March 4-7, 2012, Al Ain, UAE. *Poster Presentation*

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