Kumar Vikram Singh, Ph.D., P.E.

Chair and Professor, Mechanical and Manufacturing Engineering

Phone: (225)-773-4593
Email: singhkv@miamioh.edu

4026 Hickory Woods Drive
Mason, OH 45040

EDUCATION

Ph.D., Mechanical Engineering, Louisiana State University, Baton Rouge, LA	05/03
BE, Mechanical Engineering - Birla Institute of Technology, Ranchi, India	05/97

PROFESSIONAL EXPERIENCE

Leadership and Administrative Experience (Miami University, Oxford, OH)

Chair Mechanical and Manufacturing Engineering (MME) Department	08/23-Present
Associate Dean for Research and Graduate Programs	08/22 -07/23
Director of Research and Graduate Programs The College of Engineering and Computing (CEC)	08/20 - 08/22
Acting Associate Dean The Graduate School, Miami University, Oxford, OH	01/20 – 06/20
Graduate Program Director Mechanical and Manufacturing Engineering Department	08/17 – 12/19

Academic and Industrial Experience

Professor	08/18-Present
Associate Professor	07/12 - 07/18
Assistant Professor MME Department, Miami University, Oxford, OH	07/06 - 07/12
Visiting Researcher (Off-Campus Research Appointment) MSTC, Air Vehicles Directorate (AFRL/RQVC), Dayton, OH	09/14 - 12/14
Air Force Summer Faculty Fellowship (AFRL-SFFP) MSTC, Air Vehicles Directorate (AFRL/RQVC), Dayton, OH	2018,2016,2013-14, 2010-11
Visiting Senior Fellow (Off-Campus Research Appointment) Department of Engineering, University of Liverpool, Liverpool, UK	09/09 - 11/09
Visiting Assistant Professor	06/07 - 07/07
Research Associate	06/03 - 08/06
Research and Teaching Assistant Mechanical Engineering Department, Louisiana State University Baton Rouge, LA	01/99 - 05/03
Trainee Engineer HINDALCO Industries Limited, Renukoot, INDIA	07/97 - 07/98

LEADERSHIP AND ADMINISTRATIVE EXPERIENCE

Chair 08/23 -Present

Mechanical & Manufacturing Engineering (MME) Department, Miami University

The MME department has approximately 550 students, including ~25 graduate students and 20 full-time faculty. It offers a BS in Mechanical Engineering, Smart Manufacturing Engineering, and Engineering Management with a Manufacturing Speciality, a thesis-based MS in Mechanical Engineering, and an MEng in Mechanical and Smart Manufacturing Engineering. Starting Fall 2025, a college-wide PhD in Engineering will be offered with one track for Mechanical Engineering.

Main responsibilities include:

- Provide strategic leadership in budgeting, resource allocation, and program assessment
- Manage department's operating budget, designated and foundation/gift funds (~ over $1.15M)
- Provide vision to enhance the quality/reputation of programs and increase enrollment
- Develop strategies for student success and improve the retention and success of all students
- Assess faculty and staff performance and make recommendations for promotion and salary
- Oversee the departmental promotion/tenure and ABET accreditation process.
- Maintain/develop strong relations with MME constituencies, i.e., alumni and industries
- Enhance the resources of the department through grant writing and fundraising initiatives
- Oversee class scheduling, student outreach, recruitment, and space allocation

Major accomplishments:

- Driving enrollment growth (15%+ in MME within one year as Chair and maintaining enrollment in the second year). Led student recruitment initiatives through faculty engagement, strategic outreach, and alignment with university-wide recruitment strategies.
- Spearheaded the development of the Smart Factory Innovation and Technology (Smart-FIT) Lab in collaboration with Mitsubishi and Scadaware by securing internal funding (Boldly Creative funds) and external grants (Ohio SuperRAPIDS).
- Championed faculty development and advancement by assessing faculty and staff performance, recommending promotion, overseeing faculty searches and the P&T processes, mentoring new and continuing faculty, and advocating for departmental needs and priorities.
- Developed a comprehensive faculty workload document to align with university-wide workload assessment, which included classifying faculty scholarly contributions and external grants, and service contributions to ensure an equitable teaching load.
- Instituted a new ABET assessment plan with revised course learning outcomes for the next accreditation period and developed consistent tools for course-level assessments.
- Hired multiple tenure-track faculty members and permanent/visiting teaching faculty.
- Directed efforts to develop an innovative curriculum, including a new Master's program in Mechanical and Smart Manufacturing Engineering, a concentration in Smart Manufacturing, certificate programs, and workforce development initiatives.
- Collaborated closely with University Advancement to engage donors and industry partners by facilitating donor meetings, preparing personalized thank-you communications, providing updates on fund utilization, hosting alumni networking events, and connecting with industry leaders to foster industrial support.
- Strengthened industry and alumni relations by initiating yearly alumni panel discussions, internship/co-op experience-sharing sessions, and establishing an MME student leadership council for student engagement.

Associate Dean for Graduate Programs and Research 08/22 – 08/23
Director of Graduate Programs and Research 08/20 – 08/22
The College of Engineering and Computing (CEC), Miami University

Main responsibilities included:

- CEC's primary point of contact for graduate programs and Chair of the CEC Graduate Council
- Review and allocate CEC GA funds to departments and faculty startups
- Overseeing graduate program reporting: student rosters, funding, GA assignments
- Benchmarking/development of new graduate programs and reviewing curriculum proposals
- Schedule and host CEC New Grad Student Orientation
- Build research infrastructure and create research mentorship programs
- Review and approve CEC cost-share commitments for external grant proposals
- Leading graduate student recruitment and retention
- Establishing partnerships with other countries/universities
- Publicizing and promoting CEC graduate programs and research accomplishments
- Review and approve CEC Graduate Faculty Level Standing

Major accomplishments:

- Served as the primary leader for graduate programs within the CEC, overseeing curriculum development, admissions, and research infrastructure.
- Managed the college-wide graduate assistantship (GA) budget of $1.6M and supervised GA allocations to different departments based on teaching and research needs.
- Analyzed and benchmarked CEC's graduate assistantship (GA) needs against university-wide allocations, securing increased GA funding for the college.
- Established a non-thesis pathway for curriculum-intensive Master's programs in CEC, integrating internships and co-op experiences as culminating options to enhance professional readiness. This initiative has significantly expanded, and the first Master of Computer Science program, now enrolling over 50 students annually, since its inception in 2022.
- Developed a PhD Bridge Program in collaboration with the University of Cincinnati's (UC) Graduate School, creating a seamless transition for high-quality graduate students from Miami University's Master's programs to Engineering PhD programs at UC while establishing research collaboration, ensuring research continuity, and developing structures for joint supervision of research between the faculty of the two institutions.
- Conducted data-driven faculty research analysis, developed CEC-wide research clusters, and organized faculty research seminars to promote collaboration and increase funding success.
- Established faculty mentoring initiatives for proposal writing and expanded division-wide resources for faculty. For example, mentoring a cohort of faculty for NSF-ERI proposal writing resulted in the submission of four proposals, with one funded proposal.
- Built interdisciplinary and multi-university research collaborations, leading proposal development and external grants from Intel, NSF S-STEM, and Choose Ohio First grants. These initiatives have doubled CEC research funding in the last five years from an average of $1.25M to nearly $3M/year.
- Led international graduate student recruitment efforts, representing Miami University at recruitment events, establishing partnerships, and developing guidelines for 3-year international bachelor's degree admissions. Instituted and hosted CEC virtual information sessions to recruit international graduate students.

- Offered seminars for graduate students on university policies regarding internships and co-op, and explored external agencies that can support graduate student recruitment.
- Contributed to division-wide DEI initiatives, co-authoring a survey and action plan report on harassing behaviors in engineering majors.
- Launched the CEC Graduate Program webpage with student testimonials and success data.

Acting Associate Dean 01/20 – 06/20
The Graduate School, Miami University

Main responsibilities included:

- Support of graduate curriculum development and CIIM processes
- Assisting departments with the development of combined programs
- Guiding graduate directors with policy
- Review and approve faculty levels, dissertation committee compositions, and plan of study
- Represent the graduate school at the Chancellor's Council on Graduate Studies (CCGS)
- Graduate Certificate visioning, Bulletin review, and Graduate School announcements

Major accomplishments:

- Led the development of micro-credential and graduate certificate programs, including cybersecurity and e-sports, through curriculum innovation and faculty collaboration.
- Played a key role in drafting policies for combined BA/BS-MA/MS and honors programs, enhancing graduate pathways.
- Established new procedures for Graduate Certificates in College Teaching and supported faculty in curriculum development and approvals.
- Facilitated state and industry collaboration, leading Ohio TechCred Provider conversations between ODHE and Miami University.
- Initiated discussions to create pathways for J-1 Student Intern Programs.

Graduate Program Director 08/17 – 12/19
Mechanical & Manufacturing Engineering (MME) Department, Miami University

Main responsibilities included:

- Chairing the graduate program committee for Mechanical Engineering, overseeing admissions, assistantship allocations, and curriculum development.
- Primary contact for graduate students and applicants, providing guidance, reviewing petitions, and submitting approvals to the Graduate School.

Major accomplishments:

- Led a graduate curriculum revision, strengthening core competency courses and expanding elective courses to promote interdisciplinary research opportunities.
- Streamlined the graduate application review process, implementing an evaluation rubric to improve faculty review efficiency.
- Developed assessment tools, including evaluation instruments for Teaching and Research Assistants, and introduced an anonymous online exit survey for graduate students.
- Designed a six-semester graduate course planning strategy to optimize course offerings and co-authored the Mechanical Engineering Graduate Student Handbook.
- Championed the revision of the graduate program's Student Learning Outcomes (SLOs) to reflect changes in broadening foundational skills and independent research.

OTHER ADMINISTRATIVE, STRATEGIC, AND RELEVANT SERVICE ACTIVITIES

Managing NSF S-STEM, COF Scholarship, and Intel/OASiS Projects 08/21-Present

- Managed over $3.5 million in scholarship funding from NSF S-STEM and multiple Ohio COF grants and a multi-university OASiS grant while supporting student success.
- Developed recruitment strategies, scholarship application processes, selection rubrics, and cohort activities to enhance scholars' academic success and professional development.
- Recruited and mentored more than 75 student scholars from diverse socioeconomic backgrounds, providing guidance/support throughout their academic journey.
- Develop a Rapid Certification infrastructure at Miami University towards upskilling students in the Semiconductor manufacturing areas. More than 100 students at Miami University received these professional certificates and incentive grants.
- Led annual reporting to NSF, ODHE, and OASiS for tracking project progress and ensuring compliance with grant requirements.

Joint PI (Boldly Creative Project - CEC) and Co-Director (MME- AIMS) 05/19-Present

- Co-led the development of a CEC-wide Boldly Creative proposal in collaboration with Dr. Fazeel Khan, securing institutional support for engineering-industry partnerships. Managed the Advanced Integrated Manufacturing Systems (AIMS) initiative.
- Developed the curricular framework for badges and micro-credentials, enabling stackable/customizable learning pathways toward graduate and professional certificates.

Graduate School Scholar Assistantship (GSSA) Committee–Member 08/17-Present

- Evaluated nomination packets for graduate assistantship awards, ensuring alignment with the Graduate School's selection criteria. Reviewed applicants' academic merit and research potential to recommend scholarship recipients.

Excellence in Research & Scholarship Subcommittee (Strategic Planning)-Member 08/18-05/19

- Assessed Miami University's research and scholarship landscape, identifying strengths, weaknesses, and opportunities for growth.
- Co-led an evaluation of research infrastructure, compiling grant data for Ph.D. programs and recommending short- and long-term strategic improvements.

Selected List of Service Activities to Department, College, and University

- Miami University, Graduate Coordination Committee (Spring 2023-Present)
- Miami University Provost Search Committee (Fall 2022)
- CEC Dean Search Committee (Fall 2019-Spring 2020)
- Cybersecurity Director Search Committee (Fall 2021-Spring 2022)
- University Academic Policy Committee (Fall 15 - Spring 2022)
- India Advisory Group, Miami University (Spring 2022 - Present)
- University Academic Policy Committee (Fall 2015 - Spring 2021)
- Financing Graduate Education Committee (Summer-Fall 2020)
- All-University Committee for the Evaluation of Administrators (Fall 2013 - Spring 2014)
- University Extramural Professional Activities Committee (Fall 2012 - Spring 2014)
- CEC Outstanding Researcher Award Committee, Chair 2020, Member 2018-20
- CEC Teaching Award Committee, Chair Spring 2020, Member Spring 2018-20
- MME Promotion and Tenure Committee - Chair (2019) and Member (2012- 2023)

- Tenure Committee, Engineering Technology, Miami University, Middletown (Fall 2015).
- Chair (Fall 2016) and Member of Department Petitions Committee (Fall 2015-20)

HONORS AND AWARDS

- *The Creativity and Innovation Award*
  Miami University, 2024
- *Global Initiative of Academic Networks (GIAN) Faculty*
  Government of India, 2019
- *Outstanding Achievements in Education*
  Ohio's Magazine's Excellence in Education, 2018
- *Associate Fellow*
  American Institute of Aeronautics and Astronautics (AIAA), 2017.
- *CEC Outstanding Research Award*
  College of Engineering and Computing (CEC), Miami University, 2017.
- *Arthur Olson Teaching Excellence Award*
  College of Engineering and Computing (CEC), Miami University, 2017.
- *Outstanding Professor Nominee*
  Campus Activities Council and associated Student Government, Miami University, 2010 – 11.
- *Outstanding Graduate Research Assistant Award*
  Mechanical Engineering Department at Louisiana State University for the year 2001 - 02.
- *Air Force Summer Faculty Fellowship (AFRL-SFFP)*
  Multidisciplinary Science and Technology Center (MSTC), Aerospace Systems Directorate, Wright Patterson Air Force Base, Dayton, OH (Summer 2010-11, 2013-14, 2016, 2018)
- *Summer Faculty Fellowship*
  Collaborative Program for Faculty Development - Multi-University Research and Training in Information Assurance and Computer Security, LSU (2007 - 08)

RESEARCH GRANTS AND FUNDING

External Funding (Total > $6 Million)

- "Choose Ohio First-Pathways to Careers in Digital and Quantitative Skills," Ohio Department of Higher Education (ODHE), 08/24-08/29, $999,999, PIs: J. Sparks, J. Walden, K. V. Singh, J. Blue, and J. Wanko.
- "Future-Ready Workforce Development by Advancing Manufacturing and Cybersecurity Education with Smart Factory Lab," Super RAPIDS, Ohio Department of Higher Education (ODHE), 01/24-12/25, $696,428, Lead PI: G. Corti, PIs: ***K. V. Singh*****,** F. Khan, C.-H. Cheng, D. Hartup, J. Walden, M. Bal, and R. Abrishambaf.
- "Ohio-southwest Alliance on Semiconductors and Integrated Scalable-Manufacturing (OASiS)," Intel Semiconductor Education & Research Program, 09/22-08/26, $ 1,946,250, Project PI: Rashmi Jha (UC), ***Co-PIs****:* S. Ganapathy (WSU), G. Subramanyam (UD), and ***K. V. Singh (MU),*** MU Team: D. Garmatyuk, C.-H. Cheng, and K. Hohn (Year 1-4: $440,000).

- "Choose Ohio First - Biotechnology, Bioscience, and Assistive Technology Scholars," Ohio Department of Higher Education (ODHE), 08/23-08/28, $594,999, PIs: J. Sparks, K. Hohn, K. V. Singh, and J. Blue.
- "Choose Ohio First - Justice, Equity, Diversity, and Inclusion (COF-JEDI) in STEM Scholars at Miami University," Ohio Department of Higher Education (ODHE), 08/22-08/27, $912,000, Grant PI: Dr. Amit Shukla, Current ***PIs***: Fazeel Khan, Jennifer Blue, and ***K. V. Singh***
- "Supporting Student Success and Higher Degree Attainment in Engineering: A Scholarship-Based, Comprehensive Strategy for Talented Low-Income Students," National Science Foundation (NSF), 12/21-11/27, $1,499,238, ***PI***: ***K. V. Singh*****,** Co-PIs: Fazeel Khan, Robert Davis, and Rose Marie Ward.
- "Choose Ohio First - Engineering (COF-E) Scholarships in Industry 4.0 (Robotics, Automation, Process Control, and Advanced Manufacturing)", Ohio Department of Higher Education (ODHE), 08/21-08/26, $588,000, ***PI***: ***K. V. Singh*** and Co-PI: Fazeel Khan***.***
- "Aeroelastic performance and control for 3D printed structural components with material non-linearities", AFRL/DAGSI Ohio Student-Faculty Research Fellowship program, 2020-2021, $44,100, ***PIs***: ***K. V. Singh*** and Justin Carter (Student Scholar).
- "Optimal Design of Control Surface Actuators towards Active Aeroservoelastic Control," AFRL/DAGSI Ohio Student-Faculty Research Fellowship program, 2018-2020, $63,846, ***PIs***: ***K. V. Singh*** and Danielle Oliver (Student Scholar).
- "Investigating the Effects of High Frequencies and Damping on Dynamic Bone Quality," Biomechanics & Ergonomics Research Laboratories, 2019, $5,000, ***PI***: ***K. V. Singh***.
- "Design, Fabrication, and Testing of 3D Printed Wings for Aeroservoelastic Optimization Validation", AFRL/DAGSI Ohio Student-Faculty Research Fellowship program, 2016-2018, $59,100, ***PI: K. V. Singh*** and Charlene Black (Student Scholar).
- "Active Aeroservoelastic Control and Optimization Using Receptances: Output Feedback," AFRL/SFFP at AFRL-Aerospace Systems, WPAFB, Dayton, OH, $ 20,192, Summer 2016, ***PIs: K. V. Singh*** and Charlene Black (Student Scholar).
- "Optimization of Control Surface Parameters towards Active Aeroservoelastic Control," AFRL/DAGSI Ohio Student-Faculty Research Fellowship program, 2014-2016, $60,960, ***PIs: K. V. Singh*** and Richard Brown (Student Scholar).
- "Multidisciplinary Optimization for Active Aeroelastic Control," AFRL/WPAFB: UTC, 09/2014-12/2014, $ 44,473, ***PI: K. V. Singh***.
- "Active Aeroservoelastic Control and Optimization Using In-Flight Measured Receptance," Air Force Summer Faculty/Student Fellowship (AFRL - ASEE), Summer 2014, $ 23,840, ***PIs: K. V. Singh*** and Richard Brown (Student Scholar).
- "Active Aeroservoelastic Control and Optimization Using In-Flight Measured Receptance," Air Force Summer Faculty Fellowship (SFFP), Summer 2013, $ 14,000, ***PI: K. V. Singh***.
- "TUES: Development and Integration of Synergistic Computational and Experimental Activities within the Mechanical and Manufacturing Engineering Curriculum," National Science Foundation (NSF), 05/11-05/13, $ 199,462, PI: F. Khan, ***Co-PI: K. V. Singh***.
- "Development of MATLAB-based learning modules integrating modeling, simulation, and experiments towards the characterization of polymeric biomaterials," The MathWorks Academic Support, 05/2012-08/2013, $ 39,999, ***PIs: K. V. Singh***, F. Khan.

- "Active aeroservoelastic control by using in-flight measured receptance," Air Force Summer Faculty Fellowship (AFRL-ASEE), Summer 2011, $ 23,656, ***PIs: K. V. Singh*** and Laura McDonough (Student Scholar).
- "Design of Robust and Optimal Aeroelastic Control," AFRL/DAGSI Ohio Student-Faculty Research Fellowship program, Ohio Board of Regents, 2011-2012, $64,473, ***PIs: K. V. Singh*** and Laura McDonough (Student Scholar).
- "Active aeroservoelastic control by using in-flight measured receptance," Air Force Summer Faculty Fellowship (AFRL-ASEE), Summer 2010, $ 21,472 ***PIs: K. V. Singh*** and Laura McDonough (Student Scholar).
- "Extension of Flutter Boundaries Using In-Flight Receptance Data," Air Force Office of Scientific Research - European Office of Aerospace Research and Development (AFOSR-EOARD), 2010, $ 25,000 PIs: J. Cooper and J. Mottershead (University of Liverpool, UK), ***Collaborator: K. V. Singh***.
- "Inverse Eigenvalue Problems in Active Aeroelastic Control and Optimization," AFRL Summer Researcher Program, 2009, $ 20,926 ***PIs: K. V. Singh*** and Daniel Holt (Student Scholar).
- "Non-Destructive Technique for Weld Characterization," Schneider Electric/Square D Foundation Grant, 2008, $2,000, ***PI: K.V. Singh***.
- "Structural Assessment, Monitoring, and Characterization from Measured Spectral Data using Wireless Sensor Network," Mini-Grant, NSF Faculty Development-Multi University Research and Training in Information Assurance and Computer Security, PI: S. Iyenger (LSU), 2007-08, $ 5,000, ***Participating Fellow: K.V. Singh***
- "Faculty Development –Multi University Research and Training," Summer Faculty Fellowship, Louisiana State University, $ 5,500, 05/2008, ***Participating Fellow: K.V. Singh***
- "Towards Miniaturization of the Naval Nuclear Propulsion Reactors: Novel Processing Routes of Fabricating Microstructures on Pressurized Water Reactors," US Department of Energy (DoE), (PI: S.I. Ibekwe, Southern University), 09/05–08/09, Total Amount: $1.5 M, (LSU: $222,801; PI: M.A. Wahab; ***Co-PIs*****:** S.S. Pang, ***K.V. Singh***, M. Tyagi).
- "Faculty Development –Multi University Research and Training," Summer Faculty Fellowship, Louisiana State University, $ 5,500, 05/2007, ***Participating Fellow: K.V. Singh***
- "Comprehensive Mechanical Engineering Analyses of the critical components of weaving process toward achieving size-free weaving," USDA Cooperative Research Fund, PI: Dr. S.-S. Pang (LSU), 02/05-12/07, ***Co-PI: K.V. Singh***, Amount: $85,000 (05/2007, At MU $8,944).
- "High-Velocity Impact of Composite Cryotanks Subjected to Various Projectiles," Louisiana Space Consortium Grant, 02/05-01/06, $29,976, PI: G. Li, ***Co-PI: K.V. Singh***.
- "Development of Multi-Functional Nano-Scale Syntactic Foam for High-Performance Composite Structures," Developing Aerospace Research and Technology (DART), A NASA-EPSCoR-BOR Program, 06/05-05/06, $35,000, PI: Dr. G. Li, ***Co-PI: K.V. Singh***.
- "Identification of damage in composite structures using Non-destructive dynamic testing," Louisiana's NSF-EPSCoR Pilot Funding (PFund), 02/05-01/06, $11,691, PI: Dr. S.-S. Pang, ***Co-PI: K.V. Singh***.
- "Non-destructive Damage Detection in FRP Strengthened Concrete Structures as Inverse Eigenvalue Problem," Faculty Research Grant (FRG), 2004, $10,000, PI: G. Li, ***Other Investigators: K.V. Singh***.

- "The transcendental inverse eigenvalue problem and its Application to aerospace structures," Louisiana Space Consortium Grant, 03-04, $24,938, PI: Y.M. Ram, ***Investigator: K.V. Singh***.

Internal Funding: Miami University

- "Advanced Integrated Manufacturing Program," Boldly Creative Proposal Grant, Miami University, 12/20-08/21, $368,587, ***PIs:*** Khan F. and ***Singh, K. V.***
- "Realign Engineering Programs for the new Industrial Landscape", Boldly Creative Proposal Grant, Miami University, 07/19-06/24, $1,027,000 ($80,000, 2019-20 for MME), ***PIs: Khan F. and Singh, K. V.***, Co-PIs: Abatan, A., Bal, M., Coffin, D., Garmatyuk, D., and, Zhou, Q.
- "Vibration Testing of 3D Printed Design Prototypes for MME Courses and Design Projects", Tech Fee Proposal Grant, Miami University, 05/2017, $ 20,115. ***PI: Singh, K. V.***
- "International Collaboration in Brazil", Global Initiative Fund, Miami University, 03/2014, $ 2,500. ***PI: Singh, K. V.***
- "Mechanical and Electrical Engineering Control Experiments," Tech Fee Proposal Grant, Miami University, 05/2013, $ 14,935***. PIs: Singh, K. V.*** and Cameron, T.
- "Learning Modules for Dynamics and Control of Rotating Machinery," 05/2012, $15,891. Tech Fee Proposal Grant, Miami University, ***PI: Singh, K. V.***
- "Towards the development of models and controller for next-generation rotors," Shoupp Award, Miami University, 04/2011, $5,000, ***PI: Singh, K.V.***
- "Transient dynamics of hypersonic aircraft structures under combined thermal, aero-acoustic excitation," Research Incentive Grant (RIG), Miami University, 2011-2012, $ 40,000, ***PIs:*** Shukla, A., Caraballo, E., Sommers, A., and ***Singh, K.V.***
- "Remote Identification in Human Fatigue and Jump environment," CFR, Faculty Research Grant, Miami University, 2009-2010, $22,000, PI: M. Walsh (K&H), ***Co-PI: Singh, K.V.***
- "Three-dimensional Motion Capture for Learning Enrichment," Tech Fee Proposal Grant, Miami University, 2009-2010, $96,600, PI: W. Berg (K&H), ***SEAS Participant: Singh, K.V.***
- "Research Collaboration with the University of Liverpool in active vibration control," the Hampton Fund for Faculty International Initiatives, 2009-2010, $5,000, ***PI: Singh, K.V***
- "ECP Rectilinear System for Mechanical Vibrations and Dynamic Systems Laboratory," SEAS Equipment Grant, 07/2008, $17,855, ***PI: Singh, K.V.***
- "Active Nodal Control with Time Delay," CFR, Faculty Research Grant, Miami University, 2008-2009, $22,000, ***PI: Singh, K.V.***
- "Curriculum effectiveness grant: Integrating computational methods in Engineering (ICME)," CELT, Miami University, 07-08, $4,900, PIs: Moller, J., Shukla, A., ***Participant: Singh, K.V***.
- "Learning technology summer institute," Miami University, 07/07, $500, ***Singh, K.V.***
- "Developing sensor technology for Structural Health Monitoring, design, and control of engineering structures: An inverse approach," Shoupp Award, Miami University, 2007, $3,000, ***PI: Singh, K.V.***
- "Proposal Writing Workshop," Miami University, 02/07, $400, ***Participant: Singh, K.V.***
- "New Faculty Teaching Enhancement Program (NFTEP): CELT," Miami University, 02/07, $400, Participant: Singh, K.V.

RESEARCH INTERESTS, PROJECTS, AND MENTORING

Research Interests:

Multidisciplinary Inverse Eigenvalue Problems in Vibration and Control, Aeroelasticity and Aeroservoelastic Control, Smart Viscoelastic Polymeric Materials, Composite Materials and Structures, Structural Health Monitoring, Engineering Education, and Rotor Dynamics

Selected Research Projects:

- Development of Aeroservoelastic Control Strategies
  Supported by AFRL/RQVC (Aerospace Systems Directorate), 2009-2022
  - Collaborators: Dr. R. Kolonay (AFRL-WPAFB), Dr. J. Cooper (University of Bristol, UK), Dr. J. Mottershead (University of Liverpool, UK), Dr. F. Khan (Miami University), and Dr. Y. Ram (Louisiana State University)
- Fabrication, Characterization, and Control of Smart Materials and Devices, 2012 - Present
  - Collaborators: Dr. F. Khan, Dr. J-H. Koo (MU), and Dr. Harry Pierson
- Engineering Education, 2012 - Present
  - Collaborators: Dr. F. Khan (MU), Dr. R. M. Ward (University of Cincinnati)
- Computational Tools for Bio-Mechanical Studies, 2009 - 2022
  - Collaborators: Dr. A. Bhattacharya (University of Cincinnati), Dr. M. Walsh (MU)
- Inverse Eigenvalue problems in vibration, active control, and optimization, 2008 – 2018
  - Collaborators: Dr. Yitshak Ram (Louisiana State University), Dr. Biswa Datta (Northern Illinois University), Dr. Huajiang Ouyang (University of Liverpool, UK), Dr. Rajeeb Dey (National Institute of Technology, Silchar, India)
- Rotordynamic Analysis and Control, 2012 - 2018
  - Collaborator: Mr. Sumit Singhal (SIEMENS USA), Dr. Yitshak Ram (Louisiana State University), Dr. Tim Cameron (MU)

Graduate Research Supervising:

The graduate program (MS) in Mechanical Engineering started in Fall 2010. I have supervised 15 graduate students in their thesis research as an advisor/co-advisor. Air Force Research Lab's (AFRL) Faculty and Student DAGSI Fellowships supported five projects.

- Felix Liu (Spring 2024 – Present), MS in ME (Co-advisor Dr. Koo), Research Topic: "Modeling and Simulation of Dynamic Absorption in Haptic Devices."
- Santosh Rajkumar (Spring 2021-Summer 2023), MS in ME (Co-advisor Dr. Koo), Research Topic: "Analysis and control of multifrequency haptic devices."
- Justin Carter (Fall 2020-Summer 2021, DAGSI Fellow), MS in ME, Thesis Research: "Aeroelastic performance and control for 3D printed structural components with material non-linearities."
- Danielle Oliver (Fall 2018-Summer 2020, DAGSI Fellow), MS in ME, Thesis: "Power requirements of control surface actuators towards active aeroelastic control using the method of receptances."
- Jacob Veta (Fall 2018-Summer 2020), MS in ME, Thesis: "Analysis and Development of a Lower Extremity Osteological Monitoring Tool Based on Vibration Data."

- Mariona Heras (Fall 2016-Spring 2019), MS in ME (Co-advisor Dr. Khan), Thesis: "Design, fabrication, and characterization of smart polymeric materials in vibration control applications."
- Charlene Black (Summer 2016-Spring 2018, DAGSI Fellow), MS in ME, Thesis Research: "Design of Aeroelastic Controller and Testing Protocol Using 3D Printed Wing Models."
- Richard Brown (Summer 2014 – Summer 2016, DAGSI Fellow), MS in ME, Thesis: "Optimization of control surface parameters towards active aeroservoelastic control using the method of receptances."
- George Alexander Reynolds (Fall 2014 – Summer 2016), MS in ME (Co-advised with Dr. Timothy Cameron), Thesis: "Reduction of Vibration by Oscillating Boundaries and its Application in Rotordynamics."
- Mark Fellows (Fall 2012-Summer 2014), MS in CSE (Co-advisor Dr. Shukla), Thesis: "Aeroelastic stability and control of rectangular plates with compliant boundary supports."
- Xiaoxuan Ling (Fall 2012 - Summer 2014), MS in CSE, Thesis: "Dynamic characterization, control, and optimization of viscoelastic structures."
- Neal Birchfield (Summer 2011 - Summer 2013), MS in CSE, Thesis: "Structural modification of a coupled rotordynamic system from transfer functions."
- Laura McDonough (Summer 2010 - Fall 2012, DAGSI Fellow), MS in CSE, Thesis: "Receptance based control of aeroelastic systems for flutter suppression."
- Daniel Holt (Fall 2009 - Spring 2010), MS in CSE, "Inverse Eigenvalue Problems in Active Aeroelastic Control and Optimization."
- Jesse Pratt (Fall 2008 - Summer 2009), Math Department, Independent research, "Partial Eigen-structure Assignment for Active Vibration Control."
- Pralhad Bide (Fall 2007 - Fall 2008), (Co-advised with Dr. Mark Walsh -KNH), Thesis: "Fatigue-related gender differences in the biomechanics of drop jumps."

Graduate Thesis and Non-Thesis Committee:

- Weaver, Maddie (F 24-Sp 25), "Exploring the Moderating Effect of Deep Level Diversity on the Relationship between Surface Level Diversity and Engineering Design Team Outcomes"
- Mahesh, Srihari (F 24-Sp 25), "Investigating Limit Cycle Oscillations and Postural Adaptability in Human Balance Under Increased Visual Delay in Virtual Reality".
- Rugerinyange, Regis (F 24), "Enhancing Compressive Strength of SLS Printed Lattice Structures."
- Eve Henne (F 21), "Development and Characterization of a Ceramic Coating for Carbon-Epoxy Composite Materials."
- Sharmad Joshi, (Sum. 20), "Characterization of 3D Printed Metal Oxide Composite Polymers."
- Tianqi Wang, (Sum. 20), Non-Thesis: "Real-Time Monitoring and Control of Two Tilting-Rotor Copter."
- Jeremy Schuster, (Sum. 18), "Modeling and Simulation of a Novel Electrostatic Beat Actuator for Haptic Feedback in Touch Screens."
- James Wilson, (F 15), MS/CSE, "Exploitation of nonlinear dynamics of buckled beams."

- Yu Ling, (Sum. 12), MS/CSE, "Nonlinear response of a skin panel under combined thermal and structural loading."
- Justin Gossard, (F 11), MS/CSE, "Numerical simulation of the steady-state, thermal-hydraulic performance of microchannel and minichannel evaporators with headers and louvered fins".
- Carson Wiley, (Sum. 11), MS/CSE, "The nonlinear dynamics of quiet standing in humans."

Undergraduate Research Supervising:

- Zhang, Lisa (Sum 24- Present), USS Research (Sum 24) and OSGC Fellowship (AY 24-25), "Fabrication and Testing of 3D Printed Polymers for its Torsional Dynamic Properties towards Aeroelastic Model Prototypes"
- Daniel MacManus and Maggie Jones, (Sum. 2018), "Vibration testing of graded beams."
- Jacob Veta, (Sp16-Sp18), Independent Research (MME 277R), "3D printing of wind tunnel wing sections".
- Solen Abasaba, (Sum. 17), LSAMP Summer Research Program, "Material Characterization of 3D printed composites".
- Dan Dezember, (Sum. 15), "Design and manufacturing of Shape Memory Polymer."
- Andrew Kolonay, (Sum. 15), Summer Research, "Characterization of 3D printed Polymers".
- Bryce Ziegman, (Sum. 14), Summer Research, "Quanser servo-motor control experiment setup."
- Eric Kousaie, (Sum. 14), Summer Research, "Large shaker control and operation."
- Richard Brown, (Sum. 13), USS Research (MME 340U), "Dynamic characterization of SMP."
- Joshua Fulan, (Sum. 13), Summer Research, "Simulation tools for rotordynamics."
- Megan Blackwell, (Sum. 13), Summer Research, "Mass-Loaded Beam Vibration Experiment."
- Eric Lee and Richard Brown, (Sp 13), Summer Research, "Modal testing and Development of experiments for ComEx learning modules."
- Sihong Zhao, (Sum. 09 – Sp 11), Independent Study (MME 480), Honor's Thesis: "Dynamic characterization and active modification of viscoelastic materials."
- Timothy Hanson, (Sum. 09 – Sp 10), Independent Study and USS Research (MME 340U), "Structural optimization in static and dynamic aeroelasticity."
- Laura McDonough, (Sum. 09), USS Research (MME 340U), "Computational Tools for Biomechanical Impact Studies."
- Daniel Holt, (Sum. 09), Research at AFRL-RBSD, "Towards the Development of Active Aeroservoelastic Control Schemes."
- Greg Shendel, (Sum. 2008), SEAS Summer Scholar, "NDE of Structural Health using WSN."
- Daniel Holt, (Sp. 08 and Spring 2009), Independent Study (MME 480), Honor's Thesis: "Active Zero Assignment subjected to time delay."
- Daniel Holt, (Sum. 08), USS Research (MME 340U), "Inverse Problems in Vibration."
- Tyler Robbins, (Sp. 07 – Sp. 08), Independent Study, (MME 480), Honors Thesis: "Detection of Changes in Structural Parameters from Vibration Data."

PUBLICATIONS

Notations: Graduate students *, Undergraduate students **, Presenter (collaborative work): Underline

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- Khan, F., ***Singh, K.V.***, and Carter, J.*, "Vibration Behavior of 3D-Printed Graded Composites: Fabrication and Testing", *Polymers*, 16(23), 3428, 2024.
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- ***Singh, K. V.***, Black, C.*, and Kolonay, R., "Active Aeroelastic Output Feedback Control with Partial Measurements by the Method of Receptances," *Aerospace Science and Technology*, 86, pp. 47-63, 2019.
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- ***Singh, K. V.,*** "Active Control with the Method of Receptances: Recent Progresses and its Application in Active Aeroelastic Control," *International Conference on Mathematical Modelling and Scientific Computing(ICMMSC-18)*, IIT Indore, India, July 20, 2018.
- ***Singh, K. V.,*** "Active Control of Aerospace Structures," *Global Initiative of Academic Networks (GIAN) Workshop*, National Institute of Technology, Silchar, July 15, 2019 - July 19, 2019.
- ***Singh, K. V.***, "Curricular Pathways and Pedagogical Design for Expanding the Worldview of Engineering and Computing Students," *International Conference on E-SAIL: A transformational next generation pedagogy*, 1st March 2018, Christ University, Bengaluru, India
- ***Singh, K. V.***, "Active Aeroservoelastic Control and Optimization using Receptances: Output Feedback," Final Report: Air Force Summer Faculty Fellowship Program, Air Vehicle Directorate, Wright Patterson Air Force Base (WPAFB), Dayton, OH, 12th July 2016.
- ***Singh, K. V.***, "Overview of Miami University and opportunities for International Students from Brazil," ***Presentation*** *at DARI - Diretoria Adjunta de Relações Internacionais Escola Politécnica – Universidade Federal do Rio de Janeiro*, May 18, Rio de Janeiro, Brazil, 2015.
- ***Singh, K. V.***, and Birchfield, N.*, "Utilizing vibration data for design and control: An Overview of Research and facilities at Miami University," ***Presentation*** *at SIEMENS Motor Co.*, March 10, Norwood, OH, USA, 2015.
- ***Singh, K. V.,*** "Methods for Active Aeroservoelastic Control: Aeroelastic Control Seminar Series," ***Presentation*** *at the Air Vehicles Directorate's Multidisciplinary Science and Technology Center (MSTC), WPAFB,* December 12, 2014, Dayton, OH.
- ***Singh, K. V.,*** "State Space Methods of Feedback Control: Aeroelastic Control Seminar Series," ***Presentation*** *at the Air Vehicles Directorate's Multidisciplinary Science and Technology Center (MSTC), WPAFB,* December 2, 2014, Dayton, OH, USA.
- ***Singh, K. V.,*** "Introduction to Feedback Control: Aeroelastic Control Seminar Series," ***Presentation*** *at the Air Vehicles Directorate's Multidisciplinary Science and Technology Center (MSTC), WPAFB,* November 2, 2014, Dayton, OH, USA.
- ***Singh, K. V.,*** and Brown, R. N.*, "Active Aeroservoelastic Control and Optimization Using In-Flight Measured Receptance," *Air Force Summer Faculty Fellowship Program* ***Presentation*** *at the Air Vehicles Directorate's Multidisciplinary Science and Technology Center (MSTC), WPAFB,* October 2, 2014, Dayton, OH, USA.
- Brown, R. N.*, ***Singh, K. V.,*** and Khan, F.J., "Dynamic Characteristics of Electro-active Shape Memory Polymers," ***Presentation*** *at 17th U. S. National Congress on Theoretical and Applied Mechanics,* June 16, 2014, Michigan State University, East Lansing, MI, USA.
- Fellows, M.*, ***Singh, K. V.,*** and Shukla, A., "Aeroelastic Stability of Rectangular Plates with Compliant Boundary Supports," ***Presentation*** *at 17th U. S. National Congress on Theoretical and Applied Mechanics,* June 16, 2014, Michigan State University, East Lansing, MI, USA.

- Ling, X.*, ***Singh, K. V.,*** and Zhao, S.**, "Computation and Assignment of Eigenvalues of Viscoelastic System," ***Presentation*** *at the ASME 2013 International Design Engineering Technical Conferences(IDETC 2013),* August 4-7, 2013, Portland, Oregon, USA.
- ***Singh, K. V.***, and McDonough, L. A.*, "Active Aeroelastic Control Using the Receptance Method", ***Presentation*** *at Air Force Research Lab, Air Vehicle Directorate (AFRL)*, Wright Patterson Air Force Base (WPAFB), Dayton, OH, USA, 26th September 2011.
- ***Singh, K. V.***, "Active *aeroservoelastic* control by using in-flight measured receptance," ***Final Report:*** *Air Force Summer Faculty Fellowship Program*, Air Vehicle Directorate, Wright Patterson Air Force Base (WPAFB), Dayton, OH, 22nd July 2011.
- McDonough, L. A.*, and ***Singh, K. V.***, "Effect of Control Surface on Active Control for Flutter Suppression," 36th Dayton-Cincinnati Aerospace Sciences Symposium (AIAA Sponsored), Dayton Mall Holiday Inn, Dayton, OH, 1st March 2011.
- Zhao, S.**, and ***Singh, K. V.***, "Dynamic Characterization and Active Modification of Viscoelastic Materials," 36th Dayton-Cincinnati Aerospace Sciences Symposium (AIAA Sponsored), Dayton Mall Holiday Inn, Dayton, OH, 1st March 2011.
- McDonough, L. A.*, and ***Singh, K. V.***, "Aeroelastic Control Using Receptance Frequency Response Functions," *6th Annual Dayton Engineering Sciences Symposium (ASME/AIAA Sponsored),* Wright State University Student Union, Dayton, OH, 25th October 2010.
- ***Singh, K. V.***, and McDonough, L. A.*, "Active Aeroelastic Control Using the Receptance Method", ***Presentation*** *at Air Force Research Lab, Air Vehicle Directorate (AFRL)*, Wright Patterson Air Force Base (WPAFB), Dayton, OH, USA, 21st September 2010.
- ***Singh, K. V.***, "Active aeroservoelastic control by using in-flight measured receptance," ***Final Report:*** *Air Force Summer Faculty Fellowship Program*, Air Vehicle Directorate, Wright Patterson Air Force Base (WPAFB), Dayton, OH, 24th July 2010.
- ***Singh, K. V.***, "Effect of Time Delay on Spectrum Assignment for Active Vibration Control," Guest Lecture at the Dynamics and Control Group, University of Liverpool, Liverpool, UK, 19 November 2009.
- ***Singh, K. V.***, "Towards the Development of Active Aeroservoelastic Control Schemes," Final Report: The Air Force Research Laboratory Air Vehicles Directorate, Faculty Summer Research Program, 14th September 2009.
- Pratt, J. M.*, ***Singh, K. V.***, and Datta, B. N., "Effect of Time Delay on the Partial Pole Assignment for Active Vibration Control," ***Presentation*** *at 7th International Conference on Modern Practice in Stress and Vibration Analysis, Stress and Vibration Group of the Institute of Physics*, 8-10 September 2009, New Hall, Cambridge, UK.
- Holt, D. A.**, and ***Singh, K. V.***, "Nodal Control Strategies of Viscous Systems using COMSOL®," *Proceedings of the COMSOL Conference*, Boston, October 9 – 11, 2008.
- ***Singh, K. V.***, "Towards the Development of Active Aeroservoelastic Control Schemes," Presentation at Air Force Research Lab, Air Vehicle Directorate (AFRL/RBSD), Wright Patterson Air Force Base (WPAFB), Dayton, OH, USA, 27th August 2009.
- ***Singh, K.V.***, Holt, D.**, Boehmer, S.**, and Shendel, G.**, "Undergraduate Research in the MME Department," ***Presentation*** *at the SEAS 50th Anniversary Symposium*, Miami University, April 3, 2009.

- ***Singh, K.V.***, and Holt, D.**, "Inverse Eigenvalue Problems in Structural Vibration and Control," ***Presentation*** *at SEAS Research Expo*, Miami University, February 13, 2009.
- ***Singh, K. V.*** and Shendel, G. J.**, "Towards the non-destructive evaluation of structural integrity using wireless sensor networks," *16h International Conference on Composites/Nano Engineering (ICCE -16- 2008)*, July 20-26, Kunming, China, 2008.
- Hamilton, C., ***Singh, K. V.***, and Holt D.**, "Damage Parameter Estimation and Material Characterization using Spectral Data: Non-destructive Evaluation for Friction Stir Welds and Corrosion," Presentation at AFRL-WPAFB RXLMP Directorate, Dayton, OH, April 11, 2008.
- Hamilton, C., ***Singh, K. V.***, Shukla, A., Khan, F., and Holt D.**, "Characterization of Friction Stir Welds by Static and Dynamic Analysis," ***Presentation*** *at AFRL-WPAFB, AFMC Directorate*, Dayton, OH, March 20, 2008.
- Robbins, T.**, and ***Singh, K. V.***, "Non-destructive evaluation for damage identification and quality assessment," ***Poster*** *at The 3rd Miami University CACR Symposium on Dynamical Systems in Sciences, Arts and Engineering*, Oxford, OH, March 6-7, 2008.
- Robbins, T.**, and ***Singh, K. V.***, "Detection of Changes in Structural Parameters from Vibration Data," *3rd Annual Dayton Engineering Sciences Symposium (ASME sponsored)*, Wright State University, October 29, 2007.
- Sawhney, A. P. S., Parikh, D. V., Condon, B., ***Singh, K. V.***, and Pang, S.-S., "Challenges and Opportunities in Development of Cotton-Based Nonwoven Fabrics/Composites for Apparel: Some New Concepts", *15th International Conference on Composites/Nano Engineering (ICCE -15- 2007)*, July 15-21, Haikou, Hainan Island, China, 2007.
- Sawhney, A.P.S., Hossain I.*, ***Singh, K. V.***, Condon, B., Pang S.-S., and Sachinvala, N., "Unsupervised Defect Detection in Size-Free Woven Fabrics using Wavelets and Image Morphology," *14th International Conference on Composites/Nano Engineering (ICCE -14)*, July 2-8, 2006, Boulder, CO, USA.
- Tyagi, M., Maha, A.*, ***Singh, K. V.***, Li, G. and Pang S.-S., "Simulation of Boiling Heat Transfer Around Micro Pin-Fin Heat Exchanger: Progress and Challenges", *14th International Conference on Composites/Nano Engineering (ICCE -14)*, July 2-8, 2006, Boulder, CO, USA.
- Sawhney, A.P.S., ***Singh, K. V.***, Sachinvala, N., B. Condon, and Pang S.-S., and, "The Current Status of Size-Free Weaving Research at USDA," *14th International Conference on Composites/Nano Engineering (ICCE -14)*, July 2-8, 2006, Boulder, CO, USA.
- Sawhney, A.P.S., ***Singh, K.V.,*** Condon, B., and Sachinvala, N., "Scope of Nanotechnology in Modern Textiles," ***Poster presented*** *at AATCC's 2006 International Conference & Exhibition (IC&E)*, Oct. 31-Nov.2, Atlanta, GA, 2006.
- ***Singh, K.V.***, and Tyagi, M., "Enhanced Heat Transfer in a Micro Heat Exchanger: Preliminary studies on the enhancement of heat transfer using micro pin-fins in the pressurized water reactors (PWRs)," *2006 Diversity Summit, ACAP Conference,* Nano and Composite Technology Session, Houston, April 2006.
- Sawhney, A.P.S., ***Singh, K. V.***, Hossain I., Sachinvala, N. and Pang S.-S., "Quantification of yarn abrasion in size-free weaving: A new method based on a new concept," *12th International Conference on Composites/Nano Engineering (ICCE -12)*, August 1-6, 2005, Tenerife, Spain.
- ***Singh K. V.,*** Li G., Pang, S.-S., and Jones, R., "Direct and Inverse Eigenvalue Problems in Structural Analysis and Design," *11th International Conference on Composites/Nano Engineering (ICCE 11)*, SC, August 8-14, 2004.

TEACHING

Teaching Interests:

Mechanical Vibration, Structural Dynamics and Control, Mechanics of Materials, Machine Design, Finite Element Analysis, Composite Materials, Numerical Analysis, and Aeroelasticity.

Teaching Activities:

(Associate/Assistant) Professor (08/06 - Present)
Mechanical & Manufacturing Engineering Dept., Miami University, Oxford, OH.

- MME 315-Mechanical Vibrations (Undergraduate level course)
- MME 321- System Modeling, Analysis, and Control (Undergraduate level course)
- MME 412/512-Advanced Mechanics of Materials (Undergraduate/Graduate level course)
- MME 615-Advanced Vibrations (Graduate level course)
- MME 621-Finite Element Analysis (Graduate level course)
- MME 610/677-Graduate Research Seminar (Graduate level course)
  - Average Teaching Effectiveness 3.4/4.0
  - Developed our department's first graduate-level course (MME 615) (fall 2010).
  - Developed graduate-level content for MME 512.
- MME 315 (Online course)
  - In order to expand the academic options for our students (those doing internships or co-op), I developed the first online course offered by our department. Starting in 2016, this course is offered in the winter and summer semesters.
- ComEx (Computational and Experimental) Learning Modules
  - Developed online learning modules in the areas of vibration and mechanics of materials with the NSF and MathWorks® grants.
    - http://comex.csi.muohio.edu (website in transition)
    - http://polymodmw.csi.muohio.edu (website in transition)
  - These modules are embedded in the courses (MME 315, MME 412/512) I teach.
  - Developed assessment tools and surveys for these learning modules.
- Supervised following MME 448/449-Senior Capstone Design (2007-Present)

  Served as an advisor to senior design capstone projects, including collaboration with industries (GE, SIEMENS, etc.), which is required for graduating seniors.

  - "Design for Vibration Isolators for GE Aerospace Electrical Boxes," Team Members: Neil Jain, Charlie Clark, Jake Zickerman, Nikita Shubin, Becca Wolfe, and Tung Ho (Fall 22-Spring 23)
  - "Design of a Removal and Installation mechanism for the shuttles of the Intelligrated ASRS system," Team Members: Amanda Dierkes, Josselin Juras, Drew Maxwell, Jake Zafar (Fall 2019)
  - "Design for real time Biomechanical analysis," Team Members: Nick Porter, Jacob Veta, James Stahley, Myles White-Young, (Fall 2018- Spring 2019)

- "Design and rotordynamic characterization of GE overhang rotors," Team Members: Qinran Fang, Daniel MacManus, Nathan Rayens, Rachel Scheer, Co-Advisor: Dr. Hamed Samandari (Fall 2017- Spring 2018)
- "3D printing of smart materials", Team Members: Charli Black, Mariona Heras, Wenchang Lu, Kyle Siegrist, Co-Advisor: Dr. Fazeel Khan (Fall 2016- Spring 2017)
- "Design for the characterization of the rotor core torsional stiffness of the SIEMENS rotor core," Team Members: Joseph Ambrose, Patrick Griffith, Francis O'Shaughnessy, Elliott Batchelder, (Fall 2013- Spring 2014)
- "GE Disk Damping Device," Team Members: Tasha S. Elkins, William J. Hart, Jonathan A. Sobinsky, and Samuel R. Wildeman (Fall 2012 – Spring 2013)
- "Design solutions and benchmarking of supercritical drive shafts," Team Members: James Wilson, Kevin Bowman, Kyle Ellsworth, Laura Bendula, and Joseph Healey, Co-Advisor: Dr. Tim Cameron (Fall 2011 – Spring 2012)
- "Design of Airfoil Flutter Experiment for Aeroelastic Control," Team Members: Nick DeLucio, Timothy Hanson, Sam Hathaway, Stephen Peck, and Sihong Zhao, (Fall 2010 – Spring 2011)
- "Design of Wireless Sensor Network for Structural Health Monitoring," Team Members: Alicia Bertling, Greg Shendel, and Daniel Holt (Fall 2008 – Spring 2009)
- "Design of a Prediction Tool for Siemens Motors, Cincinnati," Team Members: Steve Anderson, Cynthia Chavez, and Tyler Robbins, Co-Advisor: Dr. Amit Shukla (Fall 2007 – Spring 2008)

- Guided undergraduate and graduate research thesis, projects, and Independent studies - MME 340U, MME 480, MME 700
  - Advised six undergraduate and six graduate level research projects through independent studies and thesis research.
  - Led to three Undergraduate Honors Thesis and 11 master's theses (3 in progress).

Instructor, 01/04 –08/06
Mechanical Engineering Department, Louisiana State University, Baton Rouge, LA.

- ME 3603-Fundamentals of Instrumentation - Theory & Lab: (Spring 2006)
- ME 4133-Machine Design I - Kinematics & Dynamics of Machines: (Sum. 2005)
- ME 4183-Theory & Design of Mechanical Control System: (Spring 2005)
- ME 7233-Advanced Machine Design: Graduate level Course (Spring 2004)

Teaching Assistant, 01/99 - 05/03
Mechanical Engineering Department, Louisiana State University, Baton Rouge, LA.

- ME 4143 - Mechanical Vibration: Spring 1999, Spring 2000
- ME 3133 - Dynamics (Recitation): Summer 1999, Fall 2002
- ME 3602/3 - Fundamental of Instrumentation Lab: Fall 2001, Spring 2003

PROFESSIONAL SERVICE ACTIVITIES

Editorial Board:

- Editorial Board Member: Shock and Vibration Journal (2013 - Present)
- International Editorial Board Member: International Journal of Automotive and Mechanical Engineering (2012-2015).

Technical Committee

- Structural Dynamics Technical Committee (SDTC) member of the American Institute of Aeronautics and Astronautics (AIAA): 2015 - 2023

Panelist:

- National Defense Science and Engineering Graduate (NDSEG) Fellowship (DoD/ASEE) Application Evaluation Panel, 2014, 2020.
- Science, Mathematics, and Research for Transformation (SMART), Defense Scholarship for Service Fellowship (DoD), Application Evaluation Panel, 2015.
- Research Proposal Reviewer for Israel Science Foundation, 03/2013.
- National Science Foundation (NSF) Proposal Review Panel, Fall 2006

Conference Session Organization and Chair/Co-Chair:

- Session on Aeroservoelasticity at the AIAA Science and Technology Forum (SciTech 2020), 6-10 January 2020, Orlando, FL, USA.
- Session on Multidisciplinary Optimization and Sensitivity Analysis with Aeroelasticity and FSI I at the *60th AIAA/ASCE/AHS/ASC Structures, Structural Dynamics, and Materials Conference*, AIAA Science and Technology Forum and Exposition (SciTech 2019), 7-11 January 2019, San Diego, CA, USA.
- Session on Special Topics in Structural Dynamics and Aeroelasticity at the *58th AIAA/ASCE/AHS/ASC Structures, Structural Dynamics, and Materials Conference*, AIAA Science and Technology Forum and Exposition (SciTech 2017), 9-13 January 2017, Grapevine, TX, USA.
- Session on Dynamics, Vibration, and Control at the *ASME International Mechanical Congress & Exposition (IMECE) Conference*, 13-16 November 2016, Phoenix, AZ, USA.
- Session on Energy Harvesting at the *57th AIAA/ASCE/AHS/ASC Structures, Structural Dynamics, and Materials Conference*, AIAA Science and Technology Forum and Exposition (SciTech 2016), 4-8 January 2016, San Diego, CA, USA.
- Session on Using Learning Theories to Guide Curriculum Design at the *Frontiers in Education Conference*, 22-25 October 2014, Madrid, Spain.
- Session on Inverse Problems, *Institute for Mathematics and its Applications (IMA) conference on Linear and Numerical Linear Algebra: Theory, Methods, and Applications at Northern Illinois University: NIU LA'09, 12-14 August* 2009, DeKalb, IL, USA.
- *15th International Conference on Composites/Nano Engineering* (ICCE-16), 20-26 July 2008, Kunming, China.
- *14th International Conference on Composites/Nano Engineering* (ICCE-15), 15-21 July 2007, Haikou, Hainan Island, China.
- *11th International Conference on Composites/Nano Engineering* (ICCE-11), 8-14 August 2004, Hilton Head, SC, USA.

Conference Symposium organizer:

- Dynamics mini-symposia organizer at the *17th U. S. National Congress on Theoretical and Applied Mechanics*, June 15-20, 2014, Michigan State University, East Lansing, MI, USA.

Invited Workshops, Lectures, and Presentations

- "Active Control of Aerospace Structures," offered workshop course under the GIAN program of Ministry of HRD, Govt. of India, at National Institute of Technology Silchar, India, 15th July - 20th July 2019.
- "Active Control with the Method of Receptances: Recent Progresses and its Application in Active Aeroelastic Control," *plenary talk* at the International Conference on Mathematical Modelling and Scientific Computing(ICMMSC-18), Indian Institute of Technology, Indore, India, 07/19/2018.
- "Curricular Pathways and Pedagogical Design for Expanding the Worldview of Engineering and Computing Students," *invited presentation* at the International Conference on E-SAIL: A transformational next-generation pedagogy, Christ University, Bengaluru, India, 03/01/2018.
- "Introduction to Active Aeroelastic Control," invited post-conference lecture at International Conference on Power, Signals, Control, and Computation (EPSCICON-18), Thrissur, India, 01/16/2018.
- "Active Aeroelastic Control and Optimization using the Receptance Method," *invited lecture* at the Graduate Seminar Series, University of Cincinnati, Cincinnati, OH, USA, 09/16/2016.
- "Inverse Eigenvalue Problems in Structural Vibration and Control Overview of Research and Opportunities at Miami University," *invited presentation* at the Universidade Federal de Minas Gerais(UFMG), Belo Horizonte, Brazil, 05/15/2015.
- "Active Aeroelastic Control by the Method of Receptances," *invited lecture* at the Graduate Seminar Series, Wright State University, Dayton, OH, USA, 10/31/2014.
- "Fundamentals of Feedback Control with Aeroelastic Applications," *invited lecture* at the University of Dayton, OH, USA, 04/24/2014.
- "Active Vibration Control: Potential Applications and Challenges," *invited lecture* at Mexican National Congress, Congreso Multidisciplinario ITCG 2013, Ixtapa, Zihuatanejo, Mexico, 05/09/2013.
- "Active Vibration Control in Coupled Systems by Pole Placement***," invited guest talk at the 2nd International Conference on Power, Signals, Control,*** and Computation (EPSCICON-12), Thrissur, India, 01/05/2012.
- "Effect of Time Delay on Spectrum Assignment for Active Vibration Control," *invited talk* at the Dynamics and Control Group, University of Liverpool, Liverpool, UK, 11/19/2009.
- "Partial Spectrum Assignment in a Time Delayed System for Active Vibration Control," *invited talk* at the Institute for Mathematics and its Applications (IMA) conference on Linear and Numerical Linear Algebra: Theory, Methods, And Applications (NIU LA09), Northern Illinois University, DeKalb, IL, USA, 08/13/2009.
- "Inverse Eigenvalue Problems in Structural Vibration and Control of Composite Structures", *invited talk* at 15th International Conference on Composites/Nano Engineering, Haikou, Hainan Island, China**,** July 15-21, 2007.

Judge – Competitions

- Served as one of the judges for the AD&S student presentation at *the AIAA Science and Technology Forum and Exposition (SciTech 2020)*, Jan 8th, 2020.
- Served as one of the judges for the AD&S student presentation at *the AIAA Science and Technology Forum and Exposition (SciTech 2018)* on Jan 10th, 2018.
- Served as one of the judges for the MSNDC Student Paper Competition at *the ASME International Design Engineering Technical Conferences (IDETC 2017)* on August 7th, 2017.
- Served as one of the judges for the AD&S student presentation at *the AIAA Science and Technology Forum and Exposition (SciTech 2017)* on Jan 11th, 2017.
- Served as judge for the Engineering presentation at *the 6th Annual DOE EPSCoR and LS-LAMP Research Conference*, "Opportunities Stem from STEM Research and Education," 2002.

Membership:

ASME - American Society of Mechanical Engineers: Senior Member
AIAA - American Institute of Aeronautics and Astronautics: Associate Fellow
ASEE- American Society for Engineering Education: Member

Reviewer:

- Journals
  - AIAA Journal
  - Journal of Sound and Vibration
  - ASME-Journal of Vibration and Acoustics
  - Journal of Guidance, Control, and Dynamics
  - Journal of Vibration and Control
  - Mechanical Systems & Signal Processing
  - Journal, Aerospace Science and Technology
  - Composites Part A: Applied Science and Manufacturing Journal
  - Composites Part B: Engineering Journal
  - Non-destructive Testing and Evaluation (ND&T) Journal
  - International Journal of Pressure Vessels and Piping
  - Inverse Problems in Engineering
  - Materials and Design Journal
  - Nano Letters
  - Computer Methods in Applied Mechanics and Engineering
- Conferences
  - AIAA SciTech 2016-2020
  - ASME/IDETC 2007
  - ASME/IMECE 2010, 2013
  - IEEE Frontiers in Education Conference (FIE) 2013-2014
  - ASEE Conference 2014

Professional License:

Registered ***Professional Engineer (P.E.)*** in Louisiana (Since 2006)