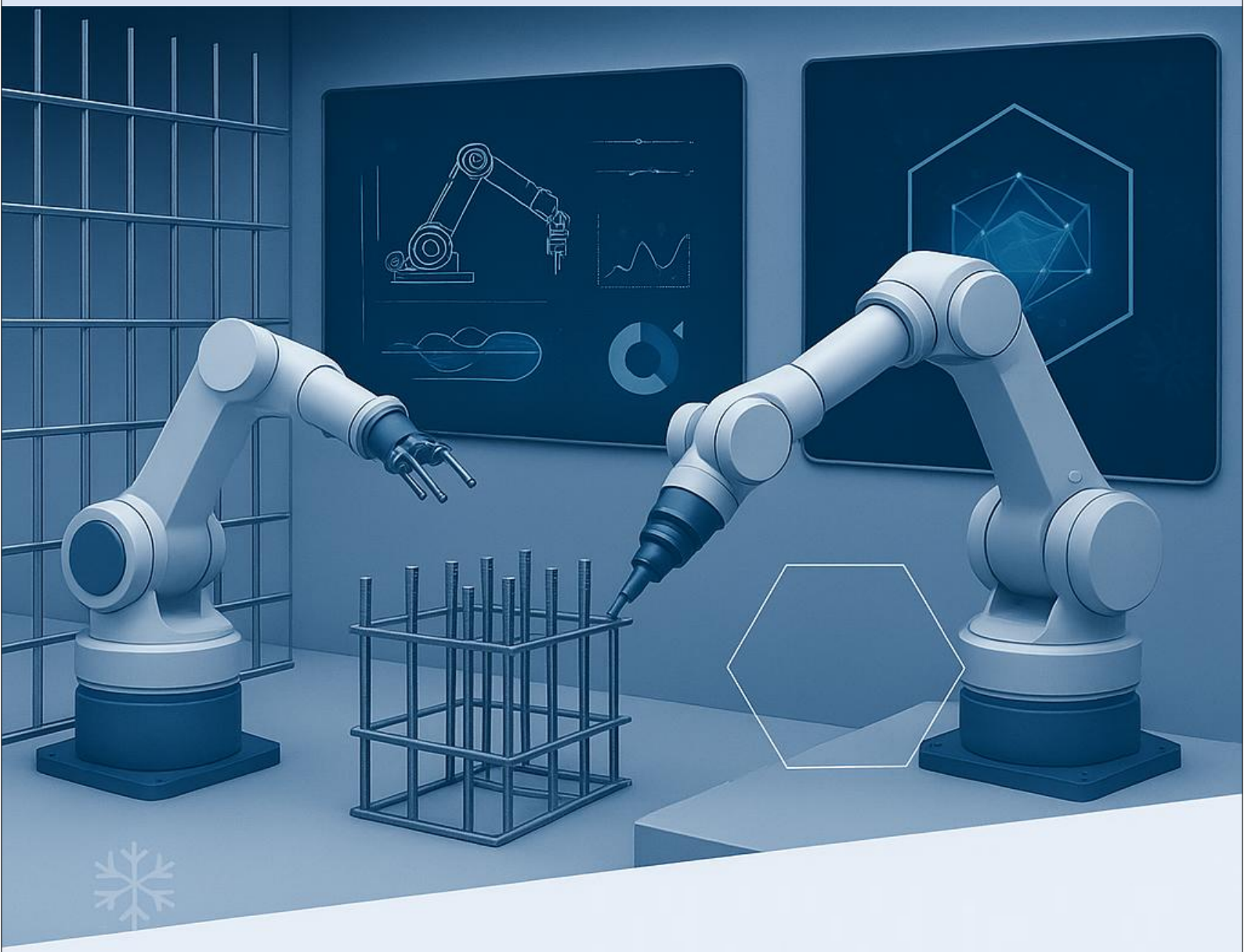
Summer 2025

ASME DSCD Newsletter

Newsletter



ASME
SETTING THE STANDARD

Editor:
Minghui Zheng, Texas A&M University

Senior Associate Editor:
Verica Gajic, Ajman University

DSCD Executive Committee Leadership (2025)

The DSCD Executive Committee (ExComm) consists of five elected voting members plus two appointed non-voting members. Each elected voting member serves a five-year term: two years as Junior Member, one year as Vice-Chair, one year as Chair, and one year as Past Chair. In addition, there are two non-voting appointed members: the Secretary and the Treasurer.

Name	Role
Atul Gajanan Kelkar	Chair
Junmin Wang	Vice Chair
Kam Leang	Senior Member
Marcello Canova	Junior Member
Mahdi Shahbakhti	Secretary
Diane Peters	Treasurer
Marcia O'Malley	Past Chair

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The Dynamic Systems and Control Division (DSCD) of ASME promotes advances in modeling, analysis, identification, control, and implementation of dynamical systems, including transportation systems, vibrations, robotics, energy systems, and bio-systems and health care. Our Division supports professional development, dissemination, training, and research across these fields. The Division holds public meetings on the first evening of both the American Control Conference (ACC) and the Modeling, Estimation and Controls Conference (MECC).

Chair's Message

Looking Ahead: Strengthening Our Division Together

Dear Members of the ASME Dynamic Systems and Control Division,

I hope this message finds you well.

It is with deep gratitude and a sense of great responsibility that I write to you as the new Chair of the Executive Committee of the ASME DSCD. I am honored to take on this role and to work alongside such a talented and dedicated community of scholars, educators, professionals, and students who have consistently advanced the field of dynamic systems and control.

As we move forward, we are all aware of the serious challenges facing our division—and indeed many professional organizations—including declining membership, reduced revenues, and the need to strengthen our visibility and alignment within the broader ASME ecosystem. These challenges require not just steady stewardship but bold, creative, and collective action.

I am reaching out to ask for your cooperation, feedback, and innovative thinking. Now, more than ever, we need fresh ideas and energy to help us revitalize our division. Whether you have a proposal for a new initiative, thoughts on strengthening member engagement, or an idea that challenges the status quo—I want to hear from you. No idea is too small, and no perspective is unimportant.

To achieve sustainable growth, it is critical that our value proposition to members and the broader professional community is clear, compelling, and forward-looking. We must strengthen the benefits we offer, enhance visibility, and deliver meaningful engagement opportunities that will attract new members and retain current ones.

I am truly excited about the road ahead and am confident that, together, we can turn these challenges into opportunities. With your partnership, support, and continued passion, we will take the DSCD to the next level.

Please fill out this form to provide your thoughts, suggestions, or interest in getting more involved: https://forms.gle/EcBEJtQpAq54Am446

Let's shape the future of our division—together.

Warm regards,
Atul Kelkar
Chair, Executive Committee
ASME Dynamic Systems and Control Division

Atul Kelkar, Ph.D.
Dean, Thomas J. Watson College of Engineering and Applied Science
Binghamton University, Binghamton, New York 13902-6000

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The Dynamic Systems and Control Division (DSCD) of ASME promotes advances in modeling, anlaysis, identification, control, and implementation of dynamical systems, including transportation sysstes, vibrations, robotics, energy systems, and biosystems and health care. Our Division supports professional development, dissemination, training, and research across these fields.

Call for Book Feedback

Introduction to Modern Controls – with illustrations in MATLAB and Python

Book website: https://mcimp-book.github.io/mcimp/

Summary

Dear Colleagues,

We are excited to share the release of our new book, **Introduction to Modern Controls – with illustrations in MATLAB and Python** (Figure 1) – a contemporary, hands-on guide to learning modern control theory and applications.

With this book, our goals are three-fold: (1) to provide a holistic introduction to state-space control theory, (2) to bridge modern control theory with widely accessible computing tools, and (3) to foster hands-on in-depth learning through practical, tunable examples coded with modern open-source software.

In pursuit of the *first goal*, this 446-page book introduces the theory and practice of state-space methods to model, analyze, and control dynamic systems. Topics include state-space modeling and solutions, stability, controllability and observability, state-feedback control, observers, observer state feedback controls, least square estimation, Kalman filter, and Linear Quadratic Gaussian optimal control (Figure 2). These topics are discussed in both continuous- and discrete-time settings throughout the book.

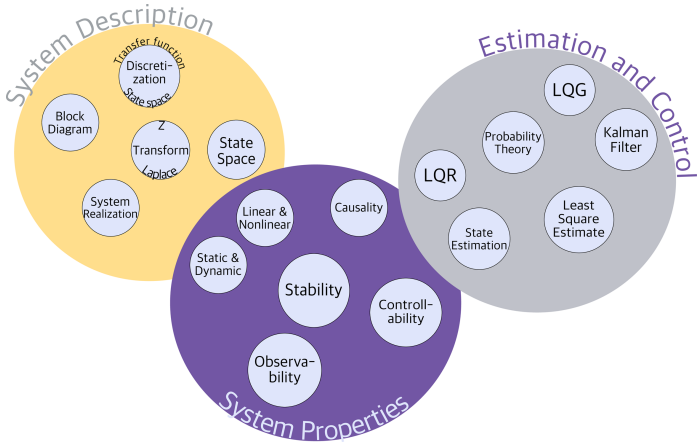


Figure 2: Overview of book topics from system description to estimation and controls

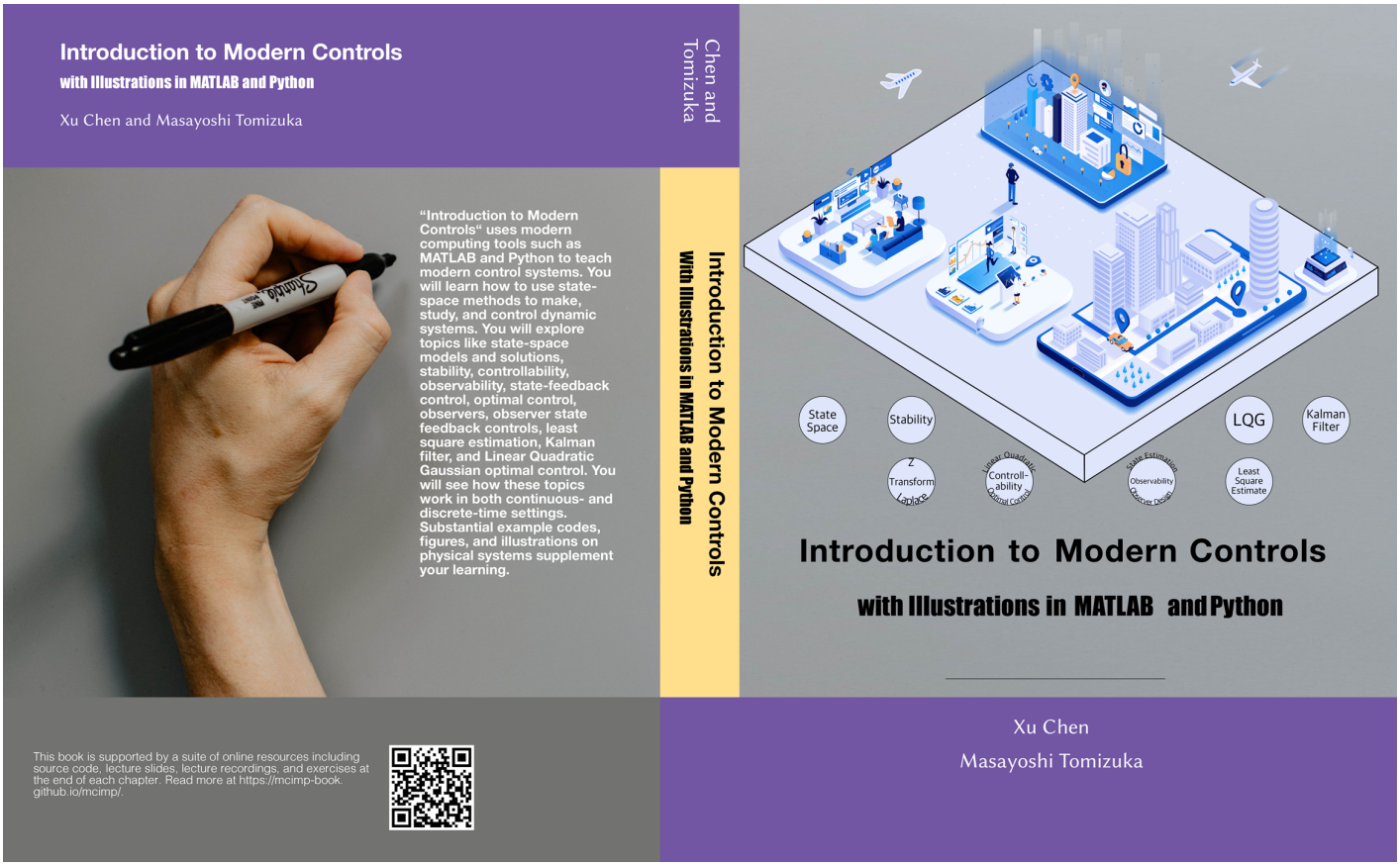


Figure 1: Front and back covers of the book

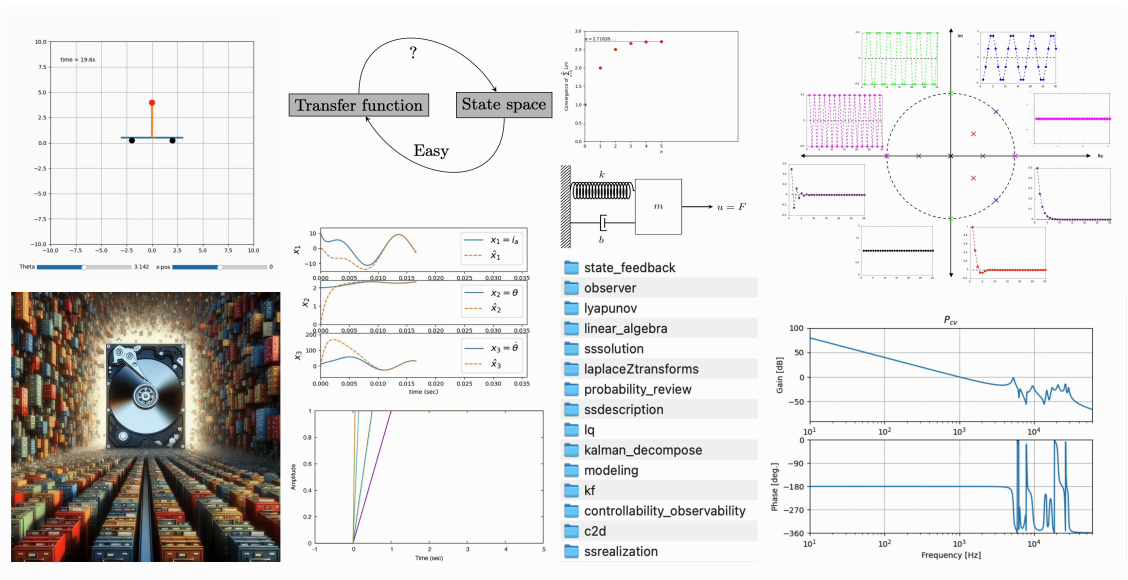


Figure 3: Sample illustrations and code simulations with real-world examples

Regarding the second goal of *disseminating controls with more accessible computing*, recent trends in open-source computing and the integration of physics-based models with large datasets are driving rapid adoption of Python-based tools in scientific computing, control, and systems engineering. In response, Introduction to Modern Controls presents its content with dual-code support—Python (61.1%) and MATLAB (38.3%)—broadening the reach and accessibility of the material for teaching, research, and application.

Pursuing the last goal of *fostering learning controls from hands-on practice*, the book includes over 300 examples, figures, tables, and exercises drawn from real physical systems to support interactive, applied learning (Figure 3).

The material in this book is based on many years of teaching experience at the University of Washington and the University of California, Berkeley. The main sources of the material are:

- ME 232 and ME 233 at the University of California, Berkeley, and
- ME 547 at the University of Washington, Seattle.

Building upon these courses, we provide a full-stack suite of open teaching resources, including:

- LaTeX-Compiled PDF Lecture Slides – styled in both midnight black (power-saving) and snowfield white (high-contrast) modes (Figure 4), with PowerPoint lecture slides underway
- Course Repositories – with recorded video lectures on most topics (Figure 5)

All these materials can be obtained for free from the **book website** (https://mcimp-book.github.io/mcimp/).

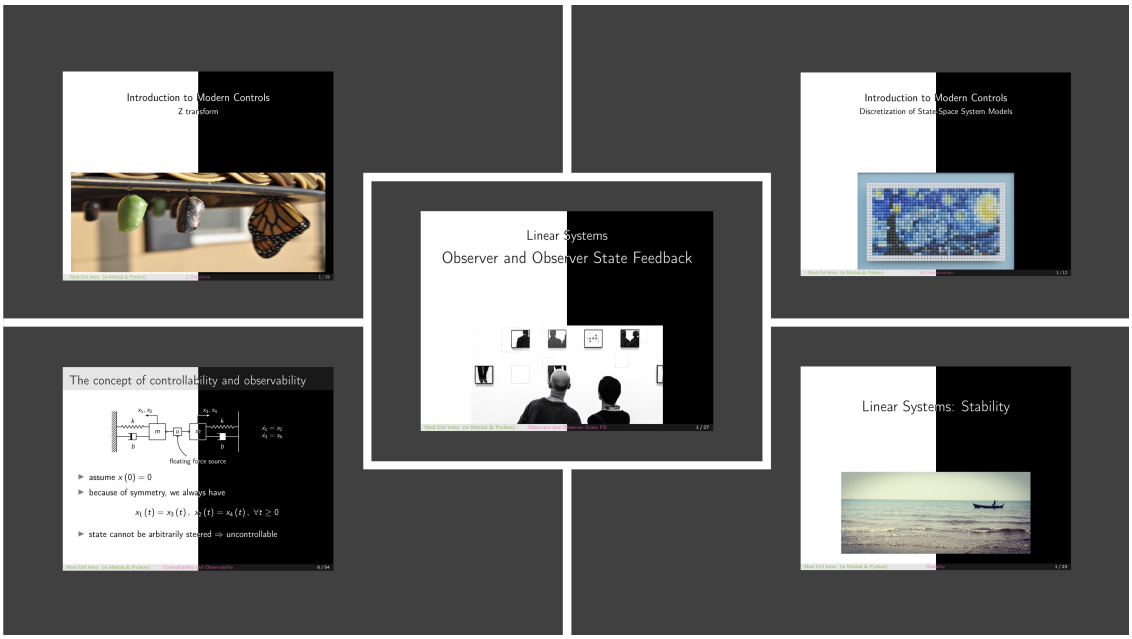


Figure 4: PDF slide decks available in dark and light themes

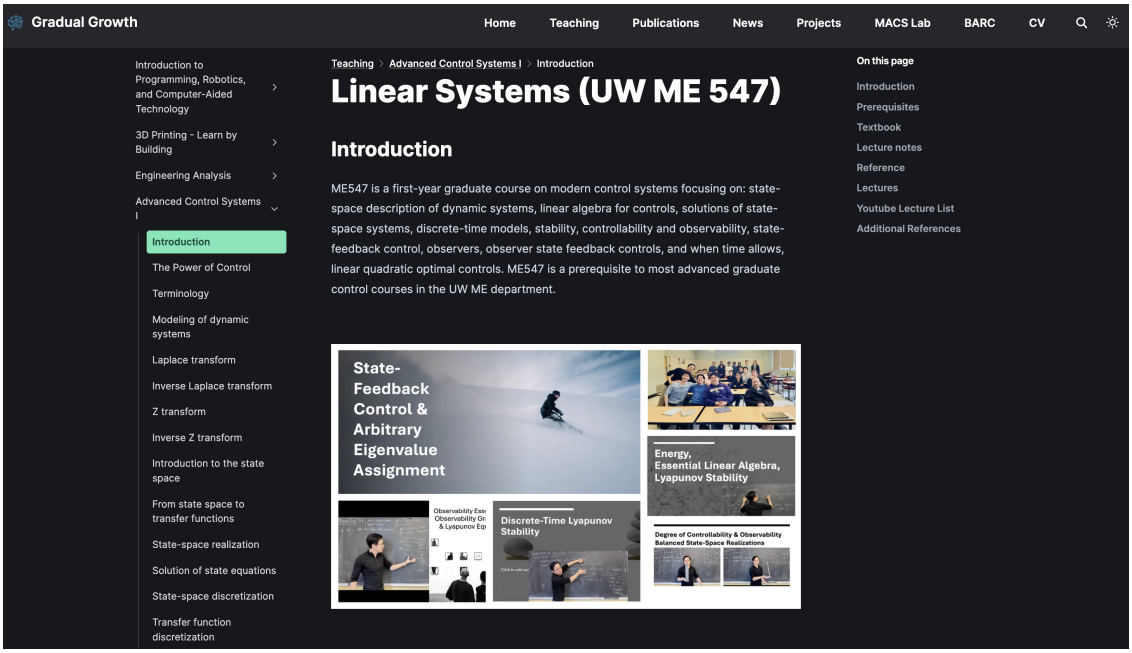


Figure 5: Example course website and recorded video lectures

We Would Love Your Feedback

We are grateful to the many teaching assistants and students who helped proofread course contents over the years. Their contributions have greatly enhanced the quality of this book. As we continue to grow this project, we warmly invite feedback from the community.

If you are an instructor and are interested in:

- using the book in your **teaching or curriculum**,
- and sharing a short **review or testimonial**,

we will be happy to provide you with a **free evaluation copy** of the book and all teaching resources. We are also keen to hear about your preferred teaching format (lecture slides, whiteboard-style, etc), and how we can better support you in applying this material. If you are a student and can provide an open review of the book on Amazon, please also let us know and we will be happy to provide you with a **free evaluation copy**.

Along with our already open-sourced resources, we will continue adding lecture content, case studies, and advanced topics throughout the year. We hope to include your review or testimonial on the front or back end of the book and/or the book website in future releases.

If you are interested in the above, please fill out the form below before **September 30, 2025**, and provide your feedback before **October 30, 2025**:

https://forms.office.com/r/yWSie5bKdg.

We look forward to learning, building, and sharing with you.

Wishing everyone a joyful summer and a smooth start to the autumn term.

Warm regards,

Xu Chen and Masayoshi Tomizuka

Enabling Robotic Fruit Harvesting through Advances in Learning and Control

Zhaojian Li
Department of Mechanical Engineering, Michigan State University

Abstract

Harvesting is one of the most labor-intensive and costly processes in fruit production. As labor shortages intensify and wages rise, there is growing demand for scalable, efficient robotic solutions. Despite substantial research and industry interest, no commercially viable robotic systems currently exist for tree fruit harvesting. Existing prototypes often fall short in performance, reliability, or cost-effectiveness in real orchard environments. This article highlights key technical challenges and recent advances in perception, mechanical design, and planning/control, with a focus on apple harvesting.

Figure 1: Prototype of the developed multi-arm apple picking robot at Li's lab.

Introduction

Robotic apple harvesting presents a complex and often underestimated challenge. Notably, several high-profile and well-funded startups—such as Abundant Robotics and Advanced Farm—have struggled to achieve sustainable deployment. The primary hurdles include achieving robust fruit detection and localization under occlusion and variable lighting, enabling efficient and damage-free fruit picking with high throughput, and maintaining low system cost for design, operation, and maintenance. Over the past six years, our research group has addressed these challenges by developing and field-testing a multi-arm apple harvesting prototype (Fig. 1). This article briefly introduces advances across the perception, mechanical design, and control layers of the system.

Perception

Accurate and reliable perception is critical for autonomous fruit harvesting. In orchard conditions, apples are often occluded by leaves, branches, and support structures. Lighting is highly variable, ranging from intense sunlight to deep shadows. To overcome these challenges, our system employs a robust perception pipeline that integrates RGBD sensing with learning-based detection, with the goal of achieving detection accuracy above 98% and localization error under 1.5 cm, while compensating for sensor noise and environmental uncertainty. Recent advances in vision foundation models have greatly enhanced perception capabilities. As demonstrated in [1], these models offer strong generalization to different lighting and occlusion scenarios, even with limited task-specific fine-tuning. With continued progress in lightweight, edge-deployable foundation models, real-time and reliable fruit perception in complex orchard environments is becoming increasingly achievable.

Mechanical Design

Mechanical design plays a crucial role in enabling fast, reliable, and gentle fruit picking. Our 4-degree-of-freedom manipulator features a pan-tilt unit, a linear actuator for canopy reach, and a rotary mechanism for fruit detachment [2]. This design supports efficient and dexterous targeting of apples within dense foliage. For end-effector design, we developed a silicone-based soft gripper combined with a vacuum system, capable of securely handling fruits of varying sizes and shapes—including clustered apples, which have historically posed a major challenge. To enhance throughput, a dual-arm module was developed that shares a common perception system and centralized vacuum [3]. A post-harvest handling mechanism was also integrated to gently transfer fruit to bins without causing damage.

Planning and Control

Once apples are detected and localized, the system must plan coordinated, collision-free motions for multiple arms. Our planning framework [3,4] begins with task assignment and sequencing of apples among the arms. For each apple, a reference trajectory is generated from the arm's home position to the fruit and then back to the drop-off point. Feedback control is applied to ensure precise trajectory tracking and manipulation. The integration of learning-based perception with model-based planning and control enables efficient and robust harvesting in unstructured environments, and the architecture is scalable to more complex canopy configurations.

Outlook

While robotic apple harvesting has yet to reach commercial viability, recent advances across sensing, AI, mechanical systems, and control are narrowing the gap. Continued innovation in these areas will be essential to realizing scalable, cost-effective robotic harvesting systems that can meet the practical demands of commercial orchards.

References

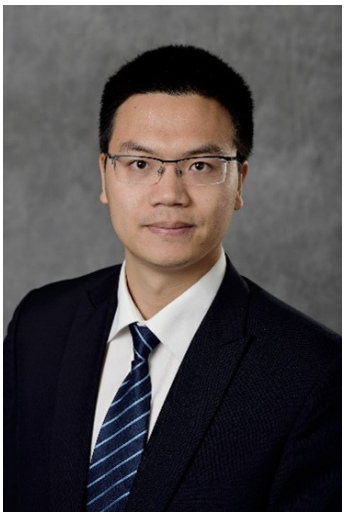
1 Li, J., Lammers, K., Yin, X., Yin, X., He, L., Sheng, J., ... & Li, Z. (2025). MetaFruit meets foundation models: Leveraging a comprehensive multi-fruit dataset for advancing agricultural foundation models. Computers and Electronics in Agriculture, 231, 109908.

2 Zhang, K., Lammers, K., Chu, P., Li, Z., & Lu, R. (2024). An automated apple harvesting robot—From system design to field evaluation. Journal of Field Robotics, 41(7), 2384-2400.

3 Lammers, K., Zhang, K., Zhu, K., Chu, P., Li, Z., & Lu, R. (2024). Development and evaluation of a dual-arm robotic apple harvesting system. Computers and Electronics in Agriculture, 227, 109586.

4 Zhang, K., Lammers, K., Chu, P., Li, Z., & Lu, R. (2021). System design and control of an apple har-

vesting robot. Mechatronics, 79, 102644.



Bio

Dr. Zhaojian Li is a Red Cedar Distinguished Associate Professor in the Department of Mechanical Engineering at Michigan State University. He obtained M.S. (2013) and Ph.D. (2015) in Aerospace Engineering (flight dynamics and control) at the University of Michigan, Ann Arbor. Dr. Li worked as an algorithm engineer at General Motors from January 2016 to July 2017. His research interests include Optimal Control and Machine Learning, with applications to Robotics and Connected Automated Vehicles. He is the author of more than 80 top journal articles and several patents. He is currently the Associate Editor for IEEE Transactions on Control System Technology, IEEE Transactions on Intelligent Vehicles, and ASME Journal of Dynamic Systems, Measurement. His research has been funded by National Science Foundation, National Institute of Health, US Department of Agriculture, Army, Office of Naval Research, Ford, DENSOR, T-Mobile, among others. He is a senior member of IEEE and a recipient of the 2021 NSF CAREER award, 2023 ASABE Engineering Concept of the Year Award, and several Best Paper awards.

Announcement of the Newly Established ASME DSCD Technical Committee on Distributed Parameter Systems

Shu-Xia Tang, Texas Tech University

We are pleased to announce the formation of the **ASME DSCD Technical Committee on Distributed Parameter Systems (DPS)**. This new committee seeks to build a vibrant and inclusive research community centered on the modeling, analysis, control, and application of DPS. The committee embraces a broad range of methodologies, and application areas span multi-agent systems, energy systems, fluid-structure interactions, transportation networks, elastic structures, and the mathematical foundations of DPS. The committee is currently led by:

- Chair: Shu-Xia Tang (Texas Tech University)
- Vice Chair: Mamadou Diagne (University of California San Diego)
- Secretary: Dong Zhang (University of Oklahoma)
- Publicity Chair: Jean Auriol (Universite Paris-Saclay, France)
- Award Committee Chair: Stevan Dubljevic (University of Alberta)
- Industry Liaison: Yebin Wang (Mitsubishi Electric Research Labs)
- Student Liaisons: Sara Sepasiahooyi and Patryck Ferreira (Texas Tech University)

We warmly invite researchers and practitioners from academia, industry, and government laboratories who are interested in distributed parameter systems to join the committee and participate in our upcoming activities. If you have not yet registered, please use the following link: .
We look forward to your involvement in shaping the future of this exciting area.

2025 NSF DCSD PI Meeting (September 4-5, 2025)

Juan Ren, Iowa State University

Dear Colleagues,

With this email, the Organizing Committee of the **2025 National Science Foundation (NSF) Control and Systems Diagnostics (DCSD) Principal Investigators' Meeting** is wishing you a great summer and inviting you to join us at the DCSD PI Meeting.

The 2025 NSF DCSD PI Meeting will be held from **September 4–5, 2025**, at the NSF headquarters located at **2415 Eisenhower Ave., Alexandria, Virginia**. This will be the first PI Meeting since the establishment of the NSF DCSD program. The 2025 DCSD PI Meeting is open to all interested researchers and students. We expect the main attendees will be the project PIs of active DCSD projects and researchers interested in pursuing NSF DCSD grants. The PI/co-PIs of active DCSD projects are invited to attend, with the expectation that each project will be represented.

The 2025 DCSD PI Meeting aims to provide an opportunity for this community to share progress, exchange ideas, and facilitate further collaborations. The PI Meeting program is designed not only to maximize participation, but also to serve as a blueprint for informing and inspiring innovative DCSD research, as well as establishing pipelines for the participation of junior DCSD researchers.

Accommodations: We are currently finalizing limited room blocks at nearby hotels. Details, including rates and booking links, will be available within a week at:
https://www.regcytes.extension.iastate.edu/nsfdcsd/travel-information/

Registration: Registration is now open until **August 20 (Central Time)** at:
https://www.regcytes.extension.iastate.edu/nsfdcsd/
Due to space limitations, registrations of non-DCSD PIs will be confirmed later through separate emails around mid-August.

Other Information: Please stay tuned for additional updates on the PI Meeting website, including program specifics and poster presentation requirements for PIs:
https://www.regcytes.extension.iastate.edu/nsfdcsd/

Do not hesitate to contact the DCSD PI Meeting organizers with any questions at:
juanren@iastate.edu and ossama@iastate.edu

We look forward to your participation and welcoming you at the 2025 DCSD PI Meeting in Alexandria!

Sincerely,
The 2025 DCSD PI Meeting Organizing Committee

Juan Ren (Chair)
Ossama Abdelkhalik (Co-Chair)

Honors and Awards

Junmin Wang received the 2024 Charles Stark Draper Innovative Practice Award

Junmin Wang, Fletcher Stuckey Pratt Chair Professor in Engineering at UT Austin, received the 2024 ASME Charles Stark Draper Innovative Practice Award from ASME Dynamic Systems and Control Division (DSCD) for his contributions to controls of Diesel engines and emissions aftertreatment systems. The Charles Stark Draper Award biennially recognizes a DSCD member for either excellent sustained contributions or for an outstanding major, singular contribution in innovative applications of dynamic systems, measurement, or control in engineering practice.

Santosh Devasia received the 2024 Henry M. Paynter Outstanding Investigator Award

Prof. Santosh Devasia, from the University of Washington, Mechanical Engineering Department was recognized with the ASME Dynamic Systems & Control Division's (DCSD's) Henry M. Paynter Outstanding Investigator Award for his seminal contributions to feedforward control theory for nonminimum-phase systems and its applications. He developed procedures to find bounded inverses for nonlinear non-minimum phase systems, where such inverses tend to be unbounded using standard methods. His group was the first to experimentally verify the inversion-based method's ability to achieve high-speed sub-nanoscale positioning with a scanning tunneling microscope when imaging carbon atoms in graphite. A fellow of ASME and IEEE, he served on the DSCD Executive Committee during 2017-2022 (chair during 2020-2021), served on the American Automatic Control Council Board of Directors (ASME Director) and the IEEE/ASME Transactions on Mechatronics Management Committee. He was the General Chair of the 2020 American Control Conference, and the General Chair of the 2023 IEEE/ASME International Conference on Advanced Intelligent Mechatronics.

Neera Jain et al. received 2024 Rudolf Kalman Best Paper Award

My colleagues Dr. Uduak Inyang-Udoh (University of Michigan Ann-Arbor) and Mr. Michael Shanks (Northrop Grumman) and I received the 2024 Rudolf Kalman Best Paper Award for our article titled "Design and Validation of a State-Dependent Riccati Equation Filter for State of Charge Estimation in a Latent Thermal Storage Device". In this paper we design and experimentally validate a state-dependent Riccati equation (SDRE) filter for state of charge (SOC) estimation in a phase change material (PCM)-based thermal energy storage (TES) device integrated into a single-phase pumped cooling loop. The advantage of the SDRE filter is that it does not require linearization of the nonlinear finite volume model; instead, it uses a linear parameter-varying system model which can be quickly derived using graph-based methods. We leverage graph-based methods to prove that the system model is uniformly detectable, guaranteeing that the state estimates are bounded. Using measurements from five thermocouples embedded in the PCM of the TES and two thermocouples measuring the fluid temperature at the inlet and outlet of the device, we estimate the temperature distribution inside the PCM and in turn, the state of charge of the device. We demonstrate the state estimator in simulation and on experimental data collected from our thermal management system testbed. For those interested, we have since integrated the estimator in a nonlinear MPC for the same system and demonstrated real-time control of the system; the work is currently under review and available on arxiv.org (https://arxiv.org/abs/2411.15929).

Changliu Liu receives the IEEE RAS Early Academic Career Award

Prof. Changliu Liu receives IEEE RAS Early Academic Career Award in Robotics and Automation for significant advancements in intelligent robot control and learning that enables safe and efficient human-robot collaboration.

New Faces Spotlight

Chen Tang joining University of California, Los Angeles

Dr. Chen Tang will join the Department of Civil and Environmental Engineering at the University of California, Los Angeles (UCLA) as an Assistant Professor in New Mobility in November 2025. Prior to that, he was a postdoctoral fellow in Computer Science at the University of Texas at Austin (UT Austin) working with Prof. Peter Stone, and a postdoctoral scholar in Mechanical Engineering at the University of California, Berkeley (UC Berkeley) working with Prof. Masayoshi Tomizuka. He received his Ph.D. degree in Mechanical Engineering from UC Berkeley in 2022, advised by Prof. Masayoshi Tomizuka, and his B.Eng. degree in Mechanical Engineering from the Hong Kong University of Science and Technology (HKUST) in 2016. He is a recipient of the IEEE ITSC Runner-up Best Student Paper Award (2018), the ASME DSCD Rising Star Award (2022), and was named an RSS Pioneer in 2023.

Dr. Chen Tang's research lies at the intersection of robotics, control, and learning, with a focus on autonomous driving and robot navigation. His work aims to ensure that autonomous vehicles and other mobility and robotic systems can safely and efficiently interact with humans. To address this challenge, he explores principled approaches that integrate data-driven techniques—such as deep learning, generative models, reinforcement learning, and imitation learning—with control theory, explainable AI, and causality. His overarching goal is to foster safe and widespread deployment of autonomous systems in open-world, human-centered environments, including transportation systems and beyond.

Jiefeng Sun joined Arizona State University

Dr. Jiefeng Sun joined the School for Engineering of Matter, Transport and Energy at Arizona State University as an Assistant Professor in January 2024. He leads the Robotic Actuators and Dynamics Lab, where his research focuses on design and control of high-performance artificial muscles (soft actuators), lightweight wearable robots, and adaptive bioinspired robots powered by these actuators. For his work on artificial-muscle-driven shape-morphing robots, he was selected as a finalist for the Best Student Paper Award at the 2018 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS). He was honored as the 2021 Reviewer of the Year by the Smart Materials and Structures journal and was selected as a 2022 DARPA Riser. Prior to joining ASU, Dr. Sun was a postdoctoral researcher at Yale University. He earned his Ph.D. in Mechanical Engineering from Colorado State University in 2022.

Feng Han joining New York Institute of Technology

Feng Han is an assistant professor in the Department of Mechanical Engineering at New York Institute of Technology. He received his bachelor's and master's degrees in aerospace engineering, and his Ph.D. in mechanical engineering from Rutgers University in 2024. His advisor is Professor Jingang Yi. Feng's research focuses on robotics and autonomous systems. It combines the traditional mathematical model and physics with a machine learning approach to better understand and manipulate dynamic systems. Robotics, mechatronics, and machine learning are his major research areas. Feng Han likes cooking, driving, national parks, and photography. See https://feltonhan.github.io/ for his online photo gallery.

New Faces Spotlight

Xiaopeng Zhang joining University of Mississippi as the department chair of Mechanical Engineering

Dr. Xiaopeng Zhao joined the University of Mississippi in August 2025 as Professor and Chair of Mechanical Engineering. He specializes in dynamics, control, and AI-driven intelligent systems with broad applications in healthcare robotics, neuroengineering, and smart manufacturing. Prior to joining Ole Miss, he served as a Professor at the University of Tennessee, Knoxville, where he was also Founding Director of the Applied AI Program and an AAAS Congressional Science & Technology Policy Fellow. His research bridges nonlinear dynamics, human-machine interaction, and translational technologies for aging and health. He is passionate about interdisciplinary innovation and expanding pathways for students to engage with the future of intelligent systems. Outside of academia, Dr. Zhao enjoys chess, travel, and community engagement around science and technology.

Subhradeep Roy joined Embry-Riddle Aeronautical University

Dr. Subhradeep Roy joined Embry-Riddle Aeronautical University – Daytona Beach in Fall 2021, where he directs the Complex Dynamical Systems Laboratory. His research focuses on understanding complex dynamics in both human-made and natural systems through interdisciplinary and data-driven approaches. His work spans traffic and transportation networks, biologically inspired swarms, and brain connectivity systems. Dr. Roy earned his Ph.D. in Engineering Mechanics from Virginia Tech in 2017. Prior to joining ERAU, he held positions as a postdoctoral researcher at Virginia Tech and as a tenure-track assistant professor at California State University, Northridge. He is the recipient of the 2023 NSF CAREER Award. Outside of academia, he enjoys traveling with his family, exploring global cuisines and cultures, and reliving his own childhood through playful moments with his two-year-old son, Rivaan.

ICL Wins the First Prize in ICRA Competition on Bimanual Packing

Changliu Liu, CMU

Our team won First Prize ($60k) in the **Packing Track** of the *What Bimanual Teleoperation and Learning from Demonstration Can Do (WBCD)* competition!

We developed a neuro-symbolic framework—called Skill Graph—that strategically decomposes the manipulation problem to leverage the best-suited method for each component:

- Data-driven models for complex perception
- Human knowledge for intuitive priors (e.g., "stacked bowls should be grasped from the interior")
- Assured and robust model-based robotics techniques, including fast motion planning and safe control

This hybrid approach enabled:

- Strong generalization across tasks (e.g., object types) and embodiments (e.g., robotic platforms and sensor configurations)—we trained on Unitree G1 and only accessed the competition setup 3 days before the event;
- Data efficiency—perception models were adapted with just one hour of retraining on a RTX 4060 laptop; skills are learned through one-shot key frame demonstrations.
- High reliability, achieving a >90% task success rate.

We were also the only team to run in fully autonomous mode in the packing track during the competition!

Associate Editor Recognition: LDSC

Qian Wang, Pennsylvania State University

Associate Editor Recognition: LDSC

The Editor-in-Chief of the *ASME Letters in Dynamic Systems and Control* would like to extend heartfelt thanks to all associate editors for volunteering their expertise and time to review manuscripts in 2024. Serving as an associate editor is a critical responsibility that upholds the high quality of our journal and provides authors with constructive and timely peer reviews.

2024 Associate Editors of the Year

- **Diane L. Peters** — Kettering University, USA
- **Javad Mohammadpour Velni** — Clemson University, USA

The *Associate Editor of the Year Award* honors associate editors who have made outstanding contributions in terms of review quantity, quality, and turnaround time over the past 12 months. Each awardee receives:

- A commemorative wall plaque
- 50 free downloads from the ASME Digital Collection
- A digital badge of recognition

List of 2024 Associate Editors:

- G.M. Clayton
- L. DeVries
- M. Inalpolat
- K.K. Leang
- W.C. Lin
- Y.C. Liu
- L. Louca
- S. Mohan
- D.L. Peters
- B. Samanta
- R. Tafreshi
- J. Mohammadpour Velni

Associate Editor Recognition: J-DSMC

Anna Stefanopoulou, University of Michigan

2024 Associate Editor Recognition: J-DSMC

The Editor-in-Chief of the *ASME Journal of Dynamic Systems, Measurement, and Control* would like to thank all the Associate Editors for their expertise and time reviewing manuscripts in 2024. Serving as an Associate Editor for the journal is a critical service necessary to maintain the quality of our publication and to provide the authors with a valuable peer review of their work. Below is a complete list of Associate Editors for 2024. We would also like to acknowledge two outstanding Associate Editors of the Year.

2024 Associate Editors of the Year Anna Stefanopoulou, University of Michigan

- **Carrie M. Hall** — Illinois Institute of Technology, USA
- **Ryozo Nagamune** — University of British Columbia, Canada

The Associate Editors of the Year Award is given to Associate Editors who have made an outstanding contribution to the journal during the past 12 months. The prize includes a Wall Plaque, 50 free downloads from the ASME Digital Collection, and a Digital Badge of Recognition.

2024 Reviewers of the Year: J-DSMC

Anna Stefanopoulou, University of Michigan

2024 Reviewers of the Year: J-DSMC

The Editor-in-Chief and Editorial Board of the *ASME Journal of Dynamic Systems, Measurement, and Control* would like to thank all of the reviewers for volunteering their expertise and time reviewing manuscripts in 2024. Serving as reviewers for the journal is a critical service necessary to maintain the quality of our publication and to provide the authors with a valuable peer review of their work. Below is a complete list of reviewers for 2024. We would also like to acknowledge four outstanding Reviewers of the Year.

2024 Reviewers of the Year

- **Md. Hazrat Ali** — Nazarbayev University, Kazakhstan
- **Filippos Fotiadis** — University of Texas at Austin, USA
- **Kaivalya Sanjeev Bakshi** — Joby Aviation, USA
- **Kavin M. Govindarajan** — University of Michigan, USA

The *Reviewers of the Year Award* is given to reviewers who have made an outstanding contribution to the journal in terms of the quantity, quality, and turnaround time of reviews completed during the past 12 months. The prize includes a Digital Plaque recognizing the contribution, as well as 50 free downloads from the ASME Digital Collection.

Statistics from the Joint MECC25 Submission to J-DSMC

Anna Stefanopoulou, University of Michigan

- **10 of 39** accepted after minor revisions — **26%**
- **17 of 39** rejected, to be considered after major revisions and full review — **43%**
- **12 of 39** rejected, beyond major revisions — **31%**

Thank you for your contributions.

Best TC paper awards (2024)

The 2024 Best Technical Committee (TC) Paper Awards recognize outstanding contributions to the field of dynamic systems and control across a range of application areas. Selected by their respective TCs, these papers exemplify excellence in research, innovation, and impact, and were presented at related leading conferences, including ACC 2024, AIM 2024, and MECC 2024.

Energy Systems

- Wang, Ruiting, Yi Ju, Zaid Allybokus, Wente Zeng, Nicolas Obrecht, and Scott Moura. *"Optimal sizing, operation, and efficiency evaluation of battery swapping stations for electric heavy-duty trucks."* In *2024 American Control Conference (ACC)*, pp. 707–712. IEEE, 2024.

- Abadie, Preston T., and Donald J. Docimo. *"An Investigation into the Viability of Cell-Level Temperature Control in Lithium-Ion Battery Packs."* *ASME Letters in Dynamic Systems and Control* 5, no. 1 (2025): 011005 (presented at MECC 2024).

Automotive and Transportation System

- Zhou, Xingyu, Hyunjin Ahn, Yung-Chi Kung, Heran Shen, and Junmin Wang. *"Adaptive Control of Vehicle Steering-by-Wire System with Varying-Degree Lyapunov Function and Deterministic Robust Control Augmentation."* In *2024 American Control Conference (ACC)*, pp. 731–736. IEEE, 2024.

- Ward, Jacob, Nan Li, David Bevly, and Lowell Brown. *"Tractor-Trailer Vehicle Rollover Avoidance Using Chance-Constrained Reference Governor and Data-Driven Ultra-Local Model."* *IFAC-PapersOnLine* 58, no. 28 (2024): 1025–1030 (presented at MECC 2024).

Robotics

- Liu, Wansong, Kareem Eltouny, Sibo Tian, Xiao Liang, and Minghui Zheng. *"Integrating uncertainty-aware human motion prediction into graph-based manipulator motion planning."* *IEEE/ASME Transactions on Mechatronics* 29, no. 4 (2024): 3128–3136 (presented at AIM 2024).

- Hu, Xiaohai, Aparajit Venkatesh, Yusen Wan, Guiliang Zheng, Neel Jawale, Navneet Kaur, Xu Chen, and Paul Birkmeyer. *"Learning to detect slip through tactile estimation of the contact force field and its entropy properties."* *Mechatronics* 104 (2024): 103258 (presented at MECC 2024).

Vibrations

- Modi, H., Hajidavalloo, M.R., Li, Z. and Zheng, M., 2024. *"Robust Iterative Learning for Collaborative Road Profile Estimation and Active Suspension Control in Connected Vehicles."* *IFAC-PapersOnLine*, 58(28), pp. 234–239 (presented at MECC 2024).

- Chu, T.L., Hu, X. and Chen, X., 2024, July. *"Optimal Loop Shaping and Disturbance Rejection Beyond the Nyquist Frequency using a Forward Model Disturbance Observer and Convex Optimization Based Filter Design."* In *2024 American Control Conference (ACC)* (pp. 1417–1422).

- Gulsacan, B. and Aureli, M., 2023. *"Nonlocal theory for submerged cantilever beams undergoing torsional vibrations."* *ASME Letters in Dynamic Systems and Control*, 3(4), p.041001 (presented at MECC 2024).

Research and Education Highlights

Complex Dynamical Systems Laboratory

By Dr. Subhradeep Roy, Embry-Riddle Aeronautical University – Daytona Beach

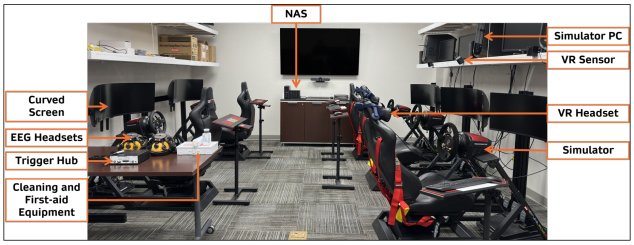


Figure 1. Multi-participant networked driving simulator setup enabling human–human interaction.

The Complex Dynamical Systems Laboratory (CDSL), directed by Dr. Subhradeep Roy at Embry-Riddle Aeronautical University – Daytona Beach, focuses on the study of emergent behaviors in complex systems such as traffic networks, brain connectivity, and biologically inspired swarms. The lab uses interdisciplinary and data-driven methodologies to understand how local interactions drive global system dynamics. One of the lab's core research platforms is a networked, multi-participant driving simulator testbed synchronized with dry EEG systems (Figure 1). This immersive environment supports real-time telemetry and cognitive-state monitoring of multiple drivers navigating shared virtual traffic scenarios. The platform enables the study of driver behavior, human-human interaction, and neural responses under controlled, repeatable conditions.

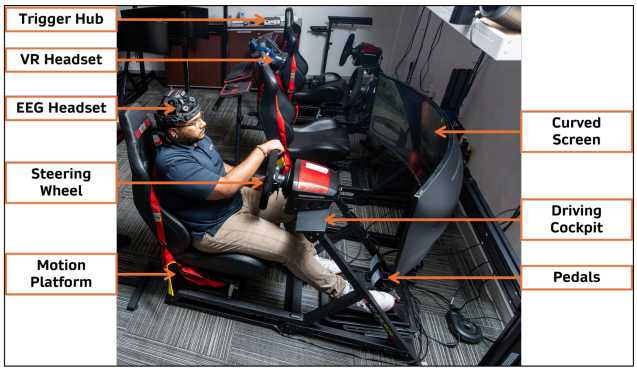


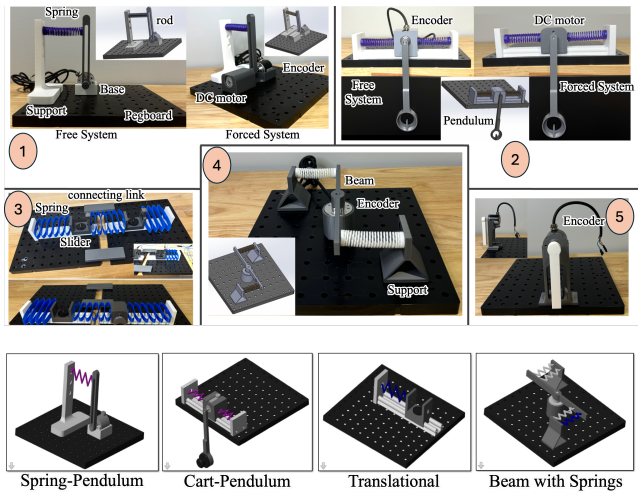
Figure 2. Key components of the driving simulator unit.

Each simulator includes a driving cockpit with a force-feedback steering wheel, pedal assembly, motion platform, VR headset (or optional curved display), and a dry EEG headset (Figure 2). The system allows for rich data collection and facilitates advanced modeling of driver dynamics, perception, and decision-making.

This platform was developed with support from the National Science Foundation CAREER Award (CMMI-2238359). The platform offers a novel and scalable framework for exploring research questions at the intersection of cognitive science, autonomous systems, and transportation engineering. We actively seek collaborative opportunities with researchers interested in traffic modeling, neuroscience, human factors, and cyber-physical systems to extend the impact and capabilities of this research platform. Learn more at: https://www.subhradeeproy.com/home.

Exploring the Synergy of Low-Cost Portable Lab Equipment, Virtual Labs, and AI within Student Learning Activities

by Ayse Tekes, Kennesaw State University



Engineering students often face significant challenges in mastering the fundamentals of dynamics, vibrations, and control theory due to the abstract and highly mathematical nature of these subjects. Concepts such as system modeling, oscillatory motion, damping, controllability, and frequency response are difficult to internalize without opportunities for hands-on exploration and iterative experimentation. These challenges are further compounded in mechanical engineering programs where lab components are often separated from lecture courses, limiting students' ability to connect theoretical content to real-world applications in a timely and meaningful way.

To address these barriers, we are developing a comprehensive, open-source dynamics and control learning package that leverages multiple representations of knowledge to support student learning across a range of instructional contexts. This work builds on our prior NSF IUSE Level 1 project and is now supported through a Level 2 grant (Award No. 2336998).

The learning package integrates four key elements:

1. Low-cost, portable, 3D-printed laboratory equipment;
2. Stand-alone, open-access virtual simulations;
3. AI-powered virtual assistants; and

4. Process-oriented, guided-inquiry learning activities.

Each component is designed to improve accessibility, support independent learning, and strengthen students' conceptual and practical understanding. The portable equipment enables hands-on experiments both inside and outside the classroom, while the virtual labs, developed in MATLAB Simscape and Simulink, allow students to simulate system behavior without the need for expensive software licenses. The AI component provides real-time support for experimental setup, theoretical modeling, data analysis, and coding, areas where students traditionally struggle the most. Learning activities are aligned with ABET outcomes and follow the Process Oriented Guided Inquiry Learning (POGIL) approach to foster critical thinking and self-reflection.

Our team is collaborating with faculty from external institutions, including Duke University, University of Michigan-Dearborn, Embry-Riddle, Georgia Southern University, and Japanese institutions, to implement and evaluate the learning package. We are working with undergraduate students as research assistants and national ambassadors to facilitate adoption through student chapters of ASME, IEEE, and other professional organizations.

All resources, including CAD files, parts lists, simulation tools, sample code, and instructional activities, are freely available via our project GitHub repository. Through this initiative, we aim to broaden participation in engineering education, promote accessibility, and equip students with the skills and confidence needed to solve complex real-world problems in dynamics and control.

The project outcomes, including 3D-PLE and Virtual Lab simulations, can be downloaded from the project website.

For more information or collaboration inquiries, please contact Dr. Ayse Tekes at atekes@kennesaw.edu, Associate Professor of Mechanical Engineering at Kennesaw State University.

Project Team: Ayse Tekes, Tris Utschig, and Coskun Tekes

Opening and Calls

Faculty position at Kettering University

Kettering University has an opening for a tenure-track Assistant Professor position in Mechanical Engineering, with a focus in dynamic systems, controls, and/or mechatronics. For more information or to apply, please visit: https://jobs.kettering.edu/postings/9777.

Postdoctoral Research Opportunities at Ole Miss

The Department of Mechanical Engineering at the University of Mississippi is inviting applications for two postdoctoral research associate positions beginning in August 2025. These positions support a strategic departmental initiative to grow research capacity at the intersection of mechanical engineering, robotics, intelligent systems, and human-centered innovation.

Under the leadership of incoming Chair Dr. Xiaopeng Zhao, postdocs will contribute to research programs in areas such as: AI and robotics for healthcare Advanced manufacturing and smart materials Control systems and intelligent mechanical design Interdisciplinary systems relevant to national and societal needs

Postdoctoral scholars will be mentored in technical excellence and academic leadership, including opportunities for grant development, student mentoring, and multi-institutional collaboration. Candidates with backgrounds in robotics, AI/ML applications in engineering, controls, or health technologies are especially encouraged to apply.

Application link: https://careers.olemiss.edu For inquiries, contact: xzhao7@olemiss.edu

Open Positions in DSCD

Assistant Communications Manager (formerly Assistant Webmaster)

The Division has an immediate opening for an **Assistant Communications Manager** (formerly titled Assistant Webmaster).
The DSCD coordinates with ASME staff to maintain our website and plans to launch a LinkedIn group in the coming year. These activities are overseen by a team of two: one Communications Manager and one Assistant Communications Manager.

Current Opening: One Assistant Communications Manager position

Communications Team:

- **Number of Members:** 2 (1 Manager and 1 Assistant Manager)
- **Tenure:** 2-year term
- **Election/Appointment:** Appointed by ExComm
- **Term Duration:** July 1 – June 30

Responsibilities: Coordinate with the DSCD Executive Committee (ExComm), the Honors and Awards Committee, Technical Committees, and ASME staff to disseminate and publicize DSCD-related content on the DSCD community website and LinkedIn. Communications Managers report to ExComm and provide updates at division meetings.

Nomination Instructions: Please include the nominee's name, email address, and phone number. Self-nominations are welcome. Submit nominations via email to `omalleym@rice.edu` with the subject line `"DSCD Communications Manager"` by **Friday, August 1, 2025**.

Newsletter Editor – Associate Editor Position

The Division also has an immediate opening for an **Associate Editor** on the DSCD Newsletter Committee.
The DSCD Newsletter is published several times a year by a team of one Editor and two Associate Editors.

Current Opening: One Associate Editor position

Newsletter Committee Structure:

- **Number of Members:** 3 (1 Editor, 2 Associate Editors)
- **Tenure:** 2-year term. An Associate Editor often (but not necessarily) becomes Editor. Members typically serve three years total: one as incoming Associate Editor, one as senior Associate Editor, and one as Editor.
- **Election/Appointment:** Appointed by ExComm
- **Term Duration:** January 1 – December 31
  (Note: The first term will begin immediately and run through December 31, 2025)

Nomination Instructions: Please include the nominee's name, email address, and phone number. Self-nominations are welcome. Submit nominations via email to `omalleym@rice.edu` with the subject line `"DSCD Newsletter Editor"` by **Friday, August 1, 2025**.

Workshop Announcements

Learning, Estimation & Control for PDE Systems

(Posted by Shu-Xia Tang, Texas Tech University)

In conjunction CCTA 2025, San Diego, CA, USA

We are excited to announce our upcoming full-day workshop, **"Learning, Estimation & Control for PDE Systems"**, to be held in conjunction with the 9th IEEE Conference on Control Technology and Applications (CCTA 2025) in San Diego, CA, USA. The organizers are **Shu-Xia Tang**, **Mamadou Diagne**, and **Leobardo Camacho-Solorio**.

This full-day workshop (https://www.shu-xia-tang.net/services-4-1) explores recent advances at the intersection of machine learning, estimation, and control for systems governed by partial differential equations (PDEs). The program features two thematic sessions:

- **Learning, Control, and Decision with PDEs**
- **Battery Modeling and Estimation with PDEs**

Topics include neural operator methods, boundary control, data-driven estimation, and multiphysics applications in mobility and energy infrastructure.

Morning Session
Keynote: *Alexandre Bayen*
Presentations: Mamadou Diagne, Yuanyuan Shi, Xiaochuan Tian, Nicholas Corbin

Afternoon Session
Keynote: *Scott Moura*
Presentations: Shu-Xia Tang, Tanushree Roy, Joseph Lucero, Leobardo Camacho-Solorio

The workshop provides a collaborative forum to exchange ideas and foster interdisciplinary research at the frontiers of control theory, applied mathematics, and cyber-physical systems. We look forward to seeing you at **CCTA 2025**!

The Future of Work in the Age of Robotics and AI

(Posted by Minghui Zheng, Texas A&M University)
Aug 21, 2025, CASE 2025

While robotics and AI are rapidly transforming the landscape of jobs and work, numerous obstacles remain in establishing new industries and job roles, all while striving to enhance productivity and the overall quality of work life. This workshop is designed to bring together individuals engaged in robotics and AI across various sectors. Its goal is to facilitate discussions on cutting-edge research, including topics such as human-robot collaboration, motion planning and control, and artificial intelligence. By examining these advancements, we aim to understand how robotics and AI will shape the future of work across industries such as manufacturing, construction, transportation, warehousing, and more. The workshop will be a half-day event, preferably scheduled for the morning of Thursday, August 21.

Speakers

- Satyandra K. Gupta, USC
- Jingang Yi, Rutgers University
- Ken Goldberg, UC Berkeley
- Kira Barton, University of Michigan
- Hao Su, New York University
- Wenlong Zhang, Arizona State University
- Tan Chen, Michigan Tech
- Michael Yip, UC San Diego
- Minghui Zheng, Texas A&M University
- Chen Tang, UC Los Angeles
- Yu She, Purdue University

Organizers: Minghui Zheng, Hao Su, Tan Chen, and Jingang Yi

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2025 Modeling, Estimation and Control Conference

October 5 - 8, 2025 (Sunday – Wednesday)

Pittsburgh, Pennsylvania, USA

MECC 2025 Upcoming Key Dates

Final manuscript submission deadline: July 18, 2025

Advanced registration deadline: August 18, 2025

Conference hotel with group rate: September 14, 2025

The 2025 Modeling, Estimation and Control Conference (MECC 2025) will be held from Sunday through Wednesday, October 5 – 8, 2025 in Pittsburgh, PA, United States at the Sheraton Pittsburgh Hotel at Station Square. Pittsburgh in western Pennsylvania is an exciting place to visit for its unique blend of rich cultural scenes with numerous museums, theaters, and music venues, and outdoor activities with miles of riverfront trails, parks, and recreational areas.

MECC is an annual conference of the American Automatic Control Council (AACC), the U.S. national member organization of the International Federation for Automatic Control (IFAC). National and international society co-sponsors of MECC include member societies of AACC, the American Institute of Aeronautics and Astronautics (AIAA), American Institute of Chemical Engineers (AIChE), American Society of Civil Engineers (ASCE), American Society of Mechanical Engineers (ASME), IEEE Control Systems Society (IEEE-CSS), Institute for Operations Research and the Management Sciences (INFORMS), International Society of Automation (ISA), Society for Modeling & Simulation International (SCS), and Society for Industrial & Applied Mathematics (SIAM).

MECC 2025 aims to serve the scientific and engineering communities in the cross-disciplinary areas of modeling, estimation, and control of dynamic systems; to provide a platform for the dissemination and discussion of the state-of-the-art in relevant research areas; to create opportunities for networking with colleagues. The conference features contributed sessions, invited sessions, workshops, special sessions, plenary talks, keynote speeches, student and young professional programs, industry programs, and conference awards ceremonies. The conference will also host committee meetings and many social functions including a sight-seeing cruise on Pittsburgh's three rivers.

MECC 2025 accepts (1) manuscripts that report original research on all aspects of modeling, estimation, and control; (2) proposals for invited, special, and tutorial sessions, and workshops on emerging topics; and (3) exhibits and sponsors from industry and research laboratories. MECC 2025 is excited to announce a joint submission process, with three ASME journals including the ASME Letters in Dynamic Systems and Control (ALDSC), Journal of Dynamic Systems, Measurement and Control (JDSMC), and Journal of Autonomous Vehicles and Systems (JAVS). Manuscripts submitted through this joint process are considered for peer-reviewed publication in the journal selected by the authors. Manuscripts not recommended for journal publication receive consideration for inclusion in the peer-reviewed MECC proceedings, in the same way as the conference-only submissions. MECC proceedings are published via the open-access IFAC-PapersOnLine, indexed in EI, Scopus, Web of Science, and INSPEC.

Conference website: https://mecc2025.a2c2.org.

Conference venue: https://mecc2025.a2c2.org/sheraton-pittsburgh-hotel/

International Program Committee

Yuen Kuan Yong (Chair)
Univ. of Newcastle, AU

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Multiple Representations of Learning in Dynamics and Control: Exploring the Synergy of Low-Cost Portable Lab Equipment, Virtual Labs, and AI within Student Learning Activities

Dr. Ayse Tekes[1] , Dr. Tris Utschig[2], and Dr. Coskun Tekes[3]

1 Acting Director of Center of Use-Inspired Rehabilitation Engineering and Science and Associate Professor of Mechanical Engineering
2 Director for Scholarly Teaching, CETL, and Professor of Nuclear Engineering
3 Associate Professor of Electrical and Computer Engineering

NSF IUSE Level 2- 2336998
2024-2027

Problem Statement and Background

- **Dynamics and control courses are mathematically rigorous, often challenging students with limited math backgrounds or prior exposure.**
- **Mechanical engineering programs typically offer dynamics and control courses as 3-credit lecture-only courses, lacking integrated hands-on lab experiences.**
- **Commercial turn-key systems limit active learning by minimizing opportunities for exploration and mastery.**
- **There is still a substantial need to develop and evaluate virtual labs tailored specifically for engineering courses.**
- **Designing effective learning activities requires significant time and expertise in instructional design and the learning sciences, which many faculty lack.**

This project expands our previously funded Level 1 proposal by developing an open-source learning ecosystem combining portable lab hardware, virtual simulations, AI-based learning tools, and robustly designed learning activities.

Objectives

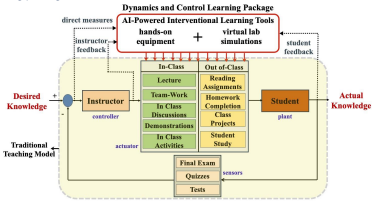
- **Develop an open-source dynamics and controls learning package that offers multiple representations of learning to improve students' conceptual understanding of dynamics, vibrations, and control theory.**
- **Create customizable, stand-alone virtual simulation labs with modular subcomponents adapted to courses such as dynamics, vibrations, mechanisms and machine design, and control systems.**
- **Design integrated learning activities that align with both 3D-printed hands-on lab equipment and virtual simulation environments to reinforce theoretical concepts through application.**
- **Incorporate AI-powered support tools to provide guided instruction and personalized learning pathways within the developed learning platform.**
- **Evaluate the educational impact of the integrated learning package on student engagement, conceptual mastery, and overall learning outcomes.**

Research Questions:

RQ1. To what degree can learning packages enhance student learning capabilities around dynamics and controls within the context of carefully designed AI-assisted learning experiences using hands-on equipment and virtual simulations?

RQ2. Why do potential users choose to use one or more parts of the dynamics and control learning package?

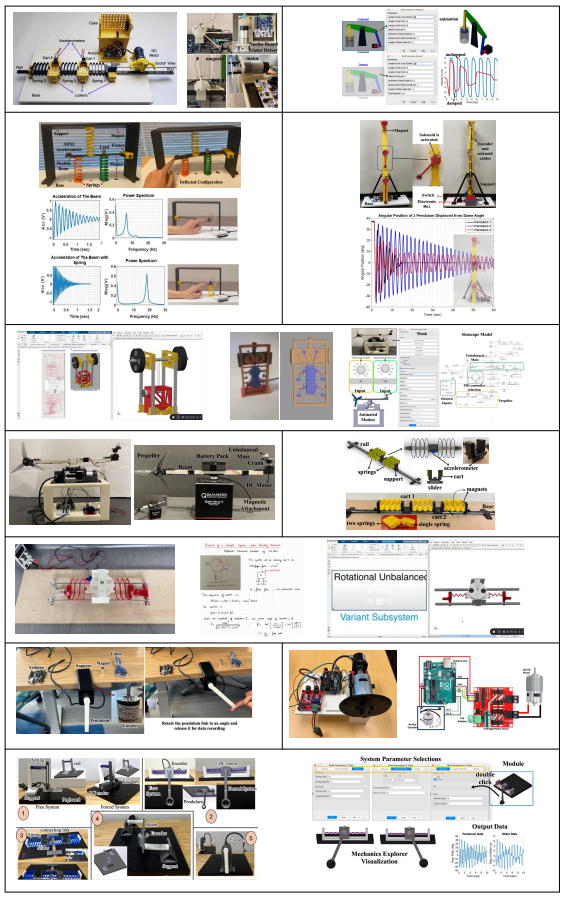
RQ3. Which element or combinations of elements in the dynamics and controls learning package are most beneficial for users?



Learning Activity Component	Description
Why	Why is it worth putting in the effort to learn the material in this activity? What value will it produce?
Learning objective(s)	What should students know and be able to do as a result of this activity?
Performance criteria	Behaviors students need perform to complete the activity well: contribute ideas, document results completely, monitor time, etc.
Instructions to students	Completely describe the learning task
Resources needed	Course readings/media/software/ other materials. Include or refer to relevant vocabulary, information and resources, and models to support analysis
Critical Thinking Questions	Progress from factual to convergent to divergent
Reflection or self/peer-assessment	Bring closure and solidify learning

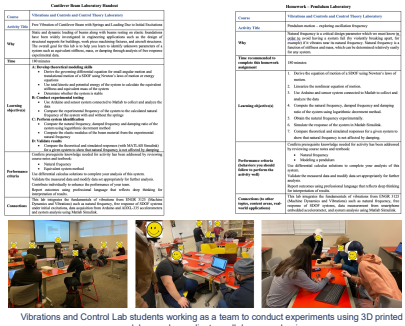
Our learning activity designs are adapted from the Process Oriented Guided Inquiry Learning (POGIL) approach.

3D Printed Lab Equipment and Virtual Lab Simulations Developed for Engineering Courses



Learning Activities

Three major educational theories underlie the design of our learning activities: Expectancy Value Theory, Growth Mindset Theory, and Social Constructivist Theory



Vibrations and Control Lab students working as a team to conduct experiments using 3D printed pendulum and compliant parallel arm mechanism

Implementation at KSU and External Institutions

KSU* - System Dynamics and Control Theory course (ME 3501), taught by the principal investigator, two experimental sections, 20 pendulum lab kits

KSU – Control Systems Lab (ECET 4610), one experimental section taught by a collaborating faculty member, 4 pendulum lab kits

KSU – Vibrations & Control Lab (ME 4501), two control & two experimental sections taught by TAs working supervised by a collaborating faculty member, 5 cantilever beam lab kits

U-MI Dearborn – one Mobile Robotics section, pendulum simulation only; one Introduction to Robotic Systems section, 4 controlled pendulum lab kits

Duke University – Dynamics (EGR 244), one expt & one control section, demonstration only

Learning objectives: modeling SDOF systems, acquiring motion data from rotary encoder, simulating system behavior; comparing experimental results with simulation outputs

Student Feedback example*: SALG survey, KSU 3501. Quality of contact with instructor and working with peers were the highest rated items. Students generally reported the assignment provided moderate amounts of help in their engineering skills development.

Student response to simple pendulum activity

SALG ITEM	Average Rating (scale 1-5) Section 1/ 2
Overall Learning Environment	
• Mental stretch required	• 2.9 / 3.5
• Quality of contact with instructor	• 3.4/3.9
• Working with peers on assignment	• 3.7/3.8
Engineering Skills Development	
• Defining problems	• 3.2/3.4
• Breaking down and analyzing problems	• 3.4/3.6
• Solving problems	• 3.3/3.6

Student response to controlled pendulum activity

SALG ITEM	Average Rating (scale 1-5)
Overall Learning Environment	
• Why is which material was approached	• 3.8
Engineering Skills Development	
• Defining problems, Solving Problems	• 3.7
• Understanding real-world relevance	• 3.7
Confidence	
• Understanding underlying theory/concepts	• 3.4
• Confidence in ability to explain theory	• 2.8
• Develop, simulate, and test control algorithms	• 2.8

Conclusions

- **Targets for cost and size of 3D-PLE devices capable of robust engineering learning activities for vibrations and control concepts are achievable.**
- **Overall positive student response to the value of 3D-PLE and virtual lab simulations learning activities is encouraging.**
- **Early data indicated merit in further exploration of the impact on engineering identity, motivation, and growth mindset.**

Acknowledgments and Contact Information

This project is funded by the National Science Foundation (Grant No. 2336998)
KSU Mechanical Engineering Faculty teaching course sections with 3D-PLE interventions

Dr. Ayse Tekes – atekes@kennesaw.edu
Dr. Tris Utschig – tutschig@kennesaw.edu
Dr. Coskun Tekes – ctekes@Kennesaw.edu
Project Evaluator – **Dr. Muhsin Menekse**, Purdue University

Texas Tech University Edward J. Whitacre College of Engineering
Department of Mechanical Engineering
Tenure-Track Faculty Positions in Aerospace and Robotics

DESCRIPTION

The DEPARTMENT OF MECHANICAL ENGINEERING in the Edward J. Whitacre College of Engineering at Texas Tech University (TTU) invites applications for multiple faculty positions beginning in the Fall of 2026. The Department is developing aerospace engineering and robotics programs. Preference will be given to applicants whose research focus is on aerospace engineering and robotics and align with the College of Engineering's major research thrusts. The areas of interest include (1) hypersonic propulsion and high-speed flows, (2) astronautics; space flight; flight dynamics & controls, and (3) robotics. This search is for all ranks of faculty, i.e., Assistant Professor/Associate Professor/Full Professor.

EXPECTATIONS

The successful candidates will be expected to develop an externally funded, independent research program and collaborate with TTU faculty across various academic units. Candidates who have very strong records of scholarship supported by extramural funding, and who have the proven capacity or clear potential to bring externally sponsored research to TTU are encouraged to apply. Teaching courses at both graduate and undergraduate levels is essential. Experience working with diverse student populations and first-generation students is highly desirable. Professional service as well as service to the department, college, and the university is expected.

QUALIFICATIONS

Applicants must hold a doctoral degree (or equivalent degree) in aerospace engineering, mechanical engineering or a closely related discipline by the date of appointment and provide a research statement relevant to the proposed research areas. The expected starting date is August 2026, although an earlier start date is possible. Applicants should submit a cover letter, a curriculum vitae (CV), a statement of research and teaching interests, and a list of at least three references. Review of applications will begin on September 15, 2025 and continue until the position is officially closed on the TTU job links. Electronic submission of application materials via http://www.depts.ttu.edu/hr/workattexastech/ is required. Search postings for requisition #41240BR.

ABOUT THE DEPARTMENT

The Department of Mechanical Engineering awarded 295 undergraduate, 40 MS and 15 PhD degrees in AY 2023-24. Department enrollment includes 1514 undergraduate students and 144 graduate students. Among the 33 tenure-track, tenured, research professors and professors of practice, roughly 30% are women and minorities. In recent years, department faculty have been awarded nearly 4 million dollars in externally sponsored research, of which 70% were from federal sources. Faculty are known for cited work on bio-inspired devices, computational mechanics, vortex dynamics, turbulence, microfluidics,

nanoimprinting, physiological microstructure and translational nutrition, cardiovascular dynamics, nanomedicine, energetic and biological materials, and robust control methods. Department faculty recognitions and awards include membership in the US National Academy of Engineering and foreign Academies of Engineering and the Sciences, recognitions as Thomson-Reuters highly cited scholars, PECASE, Young Investigator DOD awards, and NSF CAREER awards. For more information about the mechanical engineering department, please visit http://www.depts.ttu.edu/me/.

The State of Texas has the resources and desire to become a leader in the disciplines of engineering, sciences, and knowledge-based careers in the nation and world. Texas Tech University is an R1 research university and is designated as a Hispanic-Serving Institution.

Interested applicants should submit their application electronically at the links below:

Mechanical Engineering Faculty Search – Requisition #41240BR

https://sjobs.brassring.com/TGnewUI/Search/home/HomeWithPreLoad?partnerid=25898&siteid=5637&PageType=JobDetails&jobid=891654

For additional information regarding TTU or the Department of Mechanical Engineering and this position, please contact Professor Changdong Yeo, Changdong.Yeo@ttu.edu.

If you should need assistance with the application process, please contact our HR, Talent Acquisition office at hrs.recruiting@ttu.edu or 806-742-3851.

All qualified applicants will receive consideration for employment without regard to race, color, religion, sex, sexual orientation, gender identity, gender expression, national origin, age, disability, genetic information or status as a protected veteran.