

- Rackham Centennial Fellowship Award (2013)
- Outstanding Xinjiang Overseas Student Fellowship (2013)
- Kwang-Hua Scholarship (2011)
- Principal Research Fund (2010)
- Prize for Academic Excellence in Yuanpei College (2010, 2009)

Awards as Student Supervisor

- IMechE Best Student Design Award 2023/2024 (2024)
- Kerry Holding Limited UROP Award, second runner-up (2024)
- First Prize in the China College Students Mechanical Engineering Innovation and Creativity Competition, Intelligent Precision Assembly Competition (GBA) (2024)
- ASM Technology Award (2022)
- IMechE Best Student Design Award 2021/2022 (2022)

Submitted Manuscripts

- [S1] Liu, S., Wang, S., Zhou, Y., He, S., Lai, C., **Duan, M.***, under review, “A Robotic Space Tether Launching System with Tension-based Contour Keeping Control,” *IEEE Transactions on Automation Science and Engineering*.
- [S2] Yang, Y., Li, F., **Duan, M.***, under review, “Tailored Vibration Suppression for Composite Structures: Topology Optimization of Damping Layers via Conditional Generative Adversarial Networks,” *Structural and Multidisciplinary Optimization*.
- [S3] Liu, S., Lou, G., Wang, S., Ye, P., Li, B., Wong, W.Y., **Duan, M.***, under review, “Enhanced Localization with Surface Feature Tracking and Compensation for Mobile Robotic Inspection,” *Mechanical Systems and Signal Processing*.
- [S4] Law, F.C., Zhou, Y., **Duan, M.***, under review, “DLONet: Local-to-Global Consistent Occlusion Ordering for Multi-Cable Perception and Downstream Manipulation,” *IEEE Robotics and Automation Letters (RA-L)*.
- [S5] Mei, Y., Li, Y., Dong, B., Lai, C., Shi, Y., **Duan, M.***, under review, “Hierarchical Adaptive Optimal Control Allocation for Over-Actuated VTOL UAVs: Balancing Wind Resilience and Power Efficiency,” *IEEE/ASME Transactions on Mechatronics*.

Journal Publications

At HKUST (Jul 2021–present)

- [J1] Zhou, Y., Cheung, Y.H., Liu, S., Law, F.C., Shi, Y., Han, L., **Duan, M.***, 2026, “Sensorless contact forces estimation for robotic manipulators using dual-stage temporal-residual neural network compensation,” *Control Engineering Practice*, 176, 107140.
- [J2] Zhou, Y., Huang, B., Cheung, Y.H., Ye, P., **Duan, M.***, 2026, “Computation-Efficient Path Planning Using Evolving Artificial Repulsive Force over Expanding Obstacles for Robotic Manipulator,” *ISA Transactions*, 2026.
- [J3] Dong, B., Mei, Y., Lu, X., Zhou, Y., Zhang, S., Wang, W., **Duan, M.***, 2026, “Gaussian-process-based sensor placement and uncertainty quantification for dynamic response reconstruction in flexible aeroelastic structures,” *Mechanical Systems and Signal Processing*, 257, 114426.
- [J4] Lou, G., Liu, S., Shen, Y., Wong, W.Y., Lu, Y., **Duan, M.***, 2026, “Mobile robot inspection of building plenum spaces via vision-based multi-sensor fault detection,” *Automation in Construction*, 187, 106889.

- [J5] He, D., Hao, J., Lau, T.Y., Huang, L., Chen, Y., Hu, P., Xie, J., **Duan, M.**, Liu, X., Tang, K.*, 2026, "Property-controllable process planning for multi-axis hybrid manufacturing of complex metal parts," *Computers in Industry*, 179, 104493.
- [J6] Chen, Z., Lin, X., Luo, D., **Duan, M.**, Cai, S., Xiao, D.*, 2026, "Shortened current injection for sensorless switched reluctance motor drives based on high-sensitivity-region-optimized position observer," *IEEE Transactions on Transportation Electrification*, 11454632.
- [J7] Li, Y., Yu, W., **Duan, M.**, Zhang, B., Liu, Z., Li, Q.*, 2026, "DS-LABRNav: Land-air bimodal robot navigation with traversable obstacles based on vision-language model," *IEEE Robotics and Automation Letters*, 11(7), 8471-8478.
- [J8] Asghar, A., He, S., Hu, P., **Duan, M.***, 2026, "Dynamic mode decomposition-based modeling and toolpath optimization of a robotic single point incremental forming process," *Journal of Manufacturing Processes*, 167, 507-531.
- [J9] Li, X., Hu, P.*, Huang, L., Chen, H., **Duan, M.**, Zhang, X., 2026, "An efficient cutter-facet model projection method and applications to five-axis tool path computation," *International Journal of Advanced Manufacturing Technology*.
- [J10] Chen, Y., Zhang, W., Wang, Y., Hu, P.*, **Duan, M.**, Fu, Z., Deng, X., 2026, "Bead geometry prediction of directed energy deposition based on spatio-temporal neural network model," *International Journal of Advanced Manufacturing Technology*.
- [J11] Ma, G., Cui, H., Yip, C. Y., Zhang, W., **Duan, M.***, and Yang, J.*, 2026, "Toward a High-Throughput Automated Materials Experimentation Platform: Hybrid-Automata-Inspired Modeling and Equipment Configuration Optimization," *IEEE Transactions on Automation Science and Engineering*, 23, pp. 11609-11620.
- [J12] Chen, S., Liu, S., He, S., **Duan, M.***, 2025, "Optimal-transport-based geometry modeling for material extrusion additive manufacturing," *Journal of Manufacturing Processes*, 154, pp. 236-248.
- [J13] Yang, Y., Xu, Z., **Duan, M.***, 2025, "Evolving stress-guided continuous fiber path optimization for multi-axis additive manufacturing of composite shells," *Additive Manufacturing*, 113, pp. 105012.
- [J14] Zhang, W., Wang, Y., Chen, Y., Deng, X., Wang, Y., **Duan, M.**, Hu, P., Tang, K.*, 2025, "DED bead geometry and profile prediction with multimodal spatio-temporal neural networks," *Additive Manufacturing*, 110, 104952.
- [J15] Pan, Y., Lu, X., Yu, R., Jing, L., Xu, Y., Poon, W., Zhong, H., Chen, S., **Duan, M.**, Liu, Y., Li, M.G.*, 2025, "Superwetting, self-sterilizing Cu/CuZn-ZnO grating via laser engineering for advanced droplet sensing," *Small*, 21(27), 2502976.
- [J16] Dong, B., Zhou, Y., **Duan, M.***, 2025, "Dynamic load alleviation of input-redundant flexible aircraft via nonlinear control allocation over invariant manifold," *Aerospace Science and Technology*, 162, pp. 110119.
- [J17] Liu, S., **Duan, M.***, 2025, "Cable-driven parallel robot trajectory generation with optimized orientation considering disturbance rejection," *Mechanism and Machine Theory*, 210, pp. 106016.
- [J18] Zhou, Y., Huang, B., Dong, B., Wen, Y., **Duan, M.***, 2025, "Dynamic robotic bricklaying force-position control considering mortar dynamics for enhanced consistency," *Automation in Construction*, 174, pp. 106090.
- [J19] Huang, S., Li, F., Zhou, X., **Duan, M.***, 2025, "An analytical approach for dealing with explicit physical constraints in excitation optimization problems of dynamic identification," *IEEE Transactions on Robotics*, pp. 1-20.
- [J20] Bi, D., Hu, P., Li, Z., Hao, J., Tang, K., **Duan, M.***, 2025, "Freeform trajectory generation for fiber reinforced polymer composites additive manufacturing with variable-deposition-width," *Composites Part A: Applied Science and Manufacturing*, 188, 108516.
- [J21] He, S., Ma, P., **Duan, M.***, 2024, "Continuous fiber path optimization in additive manufacturing: A gradient-based B-spline finite element approach," *Additive Manufacturing*, 86, pp. 104155.
- [J22] Zhou, Y., **Duan, M.***, 2024, "Vibration compensation of an Extendable Variable-Stiffness Boom-Lift-Mounted Robot," *IEEE/ASME Transactions on Mechatronics*, 29, 4, pp. 2812-2820.

- [J23] Yang, Y., Zhou, Y., **Duan, M.***, 2024, “Contact-force-based closed-loop control of shell structure additive manufacturing with continuous-fiber-reinforced polymer composites,” *Journal of Materials Processing Technology*, 331, pp. 118501.
- [J24] Li, M., Li, H., Ahizlane, A., Liang, C., **Duan, M.**, Xing, D., Ma, P.*, 2024, “Mechanical and morphological variations of basalt fiber in seawater and a strategy to improve its performance with nanocomposite sizing,” *Construction and Building Materials*, 420, pp. 135582.
- [J25] **Duan, M.**, Cesnik, C.E.S.*, Kolmanovsky, I.V., Vetrano, F., 2024, “Control-oriented modeling for flexible aircraft,” *Journal of Aircraft*, 61(1), 183-195.
- [J26] Chen, S., Yang, Y., Liu, S., **Duan, M.***, 2023, “In-situ additive manufacturing deposition trajectory monitoring and compensation with thermal camera,” *Additive Manufacturing*, 78, pp. 103820.
- [J27] Bi, D., **Duan, M.**, Lau, T., Xie, F., Tang, K.*, 2023, “Strength-enhanced volume decomposition for multi-directional additive manufacturing,” *Additive Manufacturing*, 69, pp. 103529.
- [J28] Chou, C., **Duan, M.**, Okwudire, C.*, 2023, “A physics-guided data-driven feedforward tracking controller for systems with unmodeled dynamics—applied to 3D printing,” *IEEE Access*, 11, pp. 14563-14574.
- [J29] Hansen, J.H., **Duan, M.**, Kolmanovsky, I.V., Cesnik, C.E.S.*, 2022, “Load alleviation of flexible aircraft by dynamic control allocation,” *Journal of Guidance, Control, and Dynamics*, 45, 10, pp. 1890-1898.
- [J30] Chou, C., **Duan, M.**, Okwudire, C.*, 2021, “A linear hybrid model for enhanced servo error pre-compensation of feed drives with unmodeled nonlinear dynamics,” *CIRP Annals - Manufacturing Technology*, 70, pp. 301-304.

Before HKUST (Jun 2021 and earlier)

- [J31] **Duan, M.**, Ramani, K.S., Okwudire, C.*, 2020, “Energy optimal control of an over-actuated hybrid feed drive under variable-frequency,” *Control Engineering Practice*, 100, pp. 104442.
- [J32] Lin, B., **Duan, M.**, Okwudire, C.*, 2019, “Analytical and low-order numerical modeling of ball-to-ball contact friction in linear ball bearings and ball screws,” *Journal of Tribology*, 141, 7, pp. 071401.
- [J33] Ramani, K.S., **Duan, M.**, Okwudire, C., Ulsoy, A.G.*, 2019, “Optimal selection of basis functions for minimum-effort tracking control of nonminimum phase systems using filtered basis functions,” *Journal of Dynamic System, Measurement and Control*, 141, 11, pp. 111009.
- [J34] **Duan, M.**, Okwudire, C.*, 2019, “Connections between control allocation and linear quadratic control for weakly redundant systems,” *Automatica*, 101, pp. 96-102.
- [J35] **Duan, M.**, Okwudire, C.*, 2018, “Proxy-based energy optimal dynamic control allocation for dual-input, single-output over-actuated systems,” *IEEE/ASME Transactions on Mechatronics*, 23, 2, pp. 895-905.
- [J36] **Duan, M.**, Yoon, D., Okwudire, C.*, 2018, “A limited-preview filtered B-spline approach to tracking control - with application to vibration-induced error compensation of a 3D printer,” *Mechatronics*, 56, pp. 287-296.
- [J37] Ramani, K.S., **Duan, M.**, Okwudire, C., Ulsoy, A.G.*, 2017, “Tracking control of linear time-invariant nonminimum phase systems using filtered basis functions,” *Journal of Dynamic System, Measurement and Control*, 139, 1, pp. 011001.
- [J38] **Duan, M.**, Okwudire, C.*, 2016, “Energy-efficient controller design for a redundantly actuated hybrid feed drive with application to machining,” *IEEE/ASME Transactions on Mechatronics*, 21, 4, pp. 1822-1834.
- [J39] Okwudire, C., Ramani, K.S., **Duan, M.***, 2016, “A trajectory optimization method for improved tracking of motion commands using CNC machines that experience unwanted vibration,” *CIRP Annals - Manufacturing Technology*, 65, 1, pp. 373-376.
- [J40] **Duan, M.**, Okwudire, C.*, 2016, “Minimum-time cornering for CNC machines using an optimal control method with NURBS parameterization,” *International Journal of Advanced Manufacturing*

Technology, 85, pp. 1405-1418.

Refereed Conference Publications

At HKUST (Jul 2021–present)

- [C1] Ye, P., Ma, Y., Zhou, Y., Chen, W., Dong, W., **Duan, M.***, 2026, “InvariantCloud: A globally invariant, uniquely indexed point cloud framework for robust 6-DoF tactile pose tracking,” *IEEE International Conference on Robotics and Automation (ICRA)*, Vienna, Austria.
- [C2] Li, F., Gao, F., Yang, Y., Zhou, Y., **Duan, M.***, 2026, “Design and multi-axis additive manufacturing of lightweight and skin-compatible mesh splints using continuous basalt fiber for rehabilitation,” *ASME Manufacturing Science and Engineering Conference (MSEC)*, State College, US.
- [C3] Yang, Y., Zhou, Y., **Duan, M.***, 2025, “Contact-force-based closed-loop control of multi-axis additive manufacturing with continuous-fiber-reinforced polymer,” *ASME International Manufacturing Science and Engineering Conference*, Greenville, US.
- [C4] Xu, Z., He, S., Lou, K., Chen, S., **Duan, M.***, 2025, “Additive manufacturing with continuous fiber: a comparison between prepreg and in-situ impregnated fiber on printing accuracy, bonding, and mechanical performance,” *ASME International Manufacturing Science and Engineering Conference*, Greenville, US.
- [C5] Lai, C., Liu, S., **Duan, M.***, 2024, “Design, manufacturing, and control of a cable-driven bionic robotic hand,” *IEEE International Conference on Robotics and Biomimetics (ROBIO)*, pp. 2056-2061.
- [C6] Lou, G., **Duan, M.***, Liang, Y., Shan, X., 2024, “Wind resistant transition trajectory generation of VTOL aircraft under control allocation framework,” *AIAA SciTech Forum*, Orlando, US.
- [C7] Zhang, W., Chen, S., Dong, B., Chen, Y., Deng, X., **Duan, M.**, Tang, K.*, 2024, “Dynamic geometric modeling for directed energy deposition process,” *ASME International Manufacturing Science and Engineering Conference*, Knoxville, US.
- [C8] **Duan, M.***, Fattah, R.J., Li, L., Park, J., 2023, “Immersive learning in mechanical engineering via an online community-based augmented reality platform,” *International Conference on Learning and Teaching for Future Readiness*, Hong Kong SAR, CN.
- [C9] **Duan, M.***, Feng, J., Liu, S., 2023, “Design, manufacturing, modelling, and control of a cable-driven parallel robot for additive manufacturing,” *IEEE International Conference on Automation Science and Engineering (CASE)*, Auckland, New Zealand.
- [C10] **Duan, M.***, Chen, S., Yang, Y., 2023, “Thermal-image-enabled additive manufacturing process monitoring and extrusion trajectory compensation,” *ASME International Manufacturing Science and Engineering Conference*, New Brunswick, US.
- [C11] **Duan, M.**, He, S., 2023, “Continuous fiber path optimization in composite additive manufacturing,” *ASME International Manufacturing Science and Engineering Conference*, New Brunswick, US.
- [C12] Pereira, M.F.V., **Duan, M.**, Cesnik, C.E.S., Kolmanovsky, I.V., Vetrano, F., 2022, “Model predictive control for very flexible aircraft based on linear parameter varying reduced-order models,” *International Forum on Aeroelasticity and Structural Dynamics*, Madrid, Spain.

Before HKUST (Jun 2021 and earlier)

- [C13] Chou, C., **Duan, M.**, Okwudire, C., 2021, “A hybrid filtered basis functions approach for tracking control of linear systems with unmodeled nonlinear dynamics,” *IEEE International Conference on Automation Science and Engineering (CASE)*, Lyon, France.
- [C14] **Duan, M.**, Kolmanovsky, I.V., Cesnik, C.E.S., 2021, “Maneuver load alleviation of very flexible

- aircraft via nonlinear decoupling control,” *AIAA Scitech Forum*, Online.
- [C15] Hansen, J.H., **Duan, M.**, Kolmanovsky, I.V., Cesnik, C.E.S., 2020, “Control Allocation for Maneuver and Gust Load Alleviation of Flexible Aircraft,” *AIAA Scitech Forum*, Orlando, US.
- [C16] **Duan, M.**, Hansen, J.H., Kolmanovsky, I.V., Cesnik, C.E.S., 2019, “Maneuver load alleviation of flexible aircraft through control allocation: a case study using X-HALE,” *International Forum on Aeroelasticity and Structural Dynamics*, Savannah, US.
- [C17] Lin, B., **Duan, M.**, Okwudire, C., Wou, J.S., 2018, “An improved analytical model of friction and ball motion in linear ball bearings with application to ball-to-ball contact prediction,” *ASME International Mechanical Engineering Congress and Exposition*, Pittsburgh, US.
- [C18] Ramani, K.S., Okwudire, C., **Duan, M.**, Ulsoy, A.G., 2018, “A lifted domain-based metric for performance evaluation of LTI and LTV discrete-time tracking controllers,” *International Symposium on Flexible Automation*, Kanazawa, Japan.
- [C19] **Duan, M.**, Okwudire, C., 2017, “Proxy-based optimal dynamic control allocation for multi-input, multi-output over-actuated systems,” *ASME Dynamic Systems and Control Conference*, Tysons, US.
- [C20] Yoon, D., **Duan, M.**, Okwudire, C., 2017, “Software-based compensation of vibration-induced errors of a commercial desktop 3D printer,” *International Conference on Virtual Machining Process Technology*, Montreal, Canada.
- [C21] Lin, B., **Duan, M.**, Okwudire, C., Wou, J.S., 2017, “A simplified analytical model of rolling/sliding behavior and friction in four-point-contact ball bearings and screws,” *ASME International Mechanical Engineering Congress and Exposition*, Tampa, US.
- [C22] **Duan, M.**, Okwudire, C., 2016, “Modeling and observer-based compensation of slip in a friction drive for servo positioning,” *International Symposium on Flexible Automation*, Cleveland, US.
- [C23] **Duan, M.**, Okwudire, C., 2016, “Near energy optimal control allocation for dual-input over-actuated systems,” *ASME Dynamic Systems and Control Conference*, Minneapolis, US.
- [C24] **Duan, M.**, Ramani, K.S., Okwudire, C., 2015, “Tracking control of non-minimum phase systems using filtered basis functions: a NURBS-based approach,” *ASME Dynamic Systems and Control Conference*, Columbus, US.
- [C25] **Duan, M.**, Okwudire, C., 2015, “Energy efficiency and performance optimized control of a hybrid feed drive,” *ASME International Manufacturing Science and Engineering Conference*, Charlotte, US.
- [C26] **Duan, M.**, Okwudire, C., 2014, “Minimum-time cornering for manufacturing machines using optimal control,” *ASME Dynamic Systems and Control Conference*, San Antonio, US.

Patents

At HKUST (Jul 2021–present)

- [P1] **Duan, M.**, Chen, S. and Yang, Y., IP.PA.01890, “In-situ additive manufacturing deposition trajectory monitoring and compensation system with thermal camera,” US Provisional Application 63/505,696 (filed Jun 2023); CN Patent ZL202410710170.2 (issued Sep 2025).
- [P2] **Duan, M.** and Zhou, Y., IP.PA.02024, “Extendable variable-stiffness boom-lift-mounted robot with vibration compensation,” US Provisional Application 63/615,786 (filed Dec 2023); US Patent 12,654,313 (issued Jun 2026); CN Application 202411946171.3 (filed Dec 2024, Published); HK Application 42025111199.3 (filed Aug 2025, Published).
- [P3] **Duan, M.** and He, S., IP.PA.02094, “Continuous fiber path optimization approach in additive manufacturing,” US Provisional Application 63/635,609 (filed Apr 2024); CN Application 202510097967.4 (filed Jan 2025, Published).
- [P4] **Duan, M.**, Liu, S. and Wang, S., IP.PA.12761, “Optimal trajectory generation and feedback tension control of a robotic space tether launching system,” US Provisional Application 63/911,507

- (filed Nov 2025); US Application (Approved for Filing); CN Application (Approved for Filing).
- [P5] **Duan, M.** and Zhou, Y., IP.PA.12763, “A force-position control system for robot bricklaying considering mortar dynamics,” US Provisional Application 63/915,650 (filed Nov 2025); CN Application (Approved for Filing).
- [P6] **Duan, M.**, Mei, Y., Wang, H., Shan, X., Li, Y. and Dong, B., IP.PA.12865, “Adaptive optimal control allocation of over-actuated VTOL UAVs for wind resilience and power efficiency,” CN Application (Approved for Filing). (Assignees: HKUST & SUSTech)
- [P7] **Duan, M.**, Zhou, Y. and Cheung, Y.H., IP.PA.12872, “Sensorless contact forces estimation method for robotic manipulators using dual-stage temporal-residual neural network compensation,” US Provisional Application 64/041,767 (filed Apr 2026); CN Application 202611125274.2 (filed Jul 2026).
- [P8] **Duan, M.**, Zhou, Y. and Cheung, Y.H., IP.PA.12873, “A computation-efficient path planning method for robotic manipulators using evolving artificial repulsive force over expanding obstacles,” US Provisional Application 64/041,762 (filed Apr 2026); CN Application (Approved for Filing).

Before HKUST (Jun 2021 and earlier)

- [P9] **Duan, M.**, Okwudire, C.E. and Ramani, K.S., “Use of filtered basis splines to compensate servo-induced motion errors,” US Patent 10,585,414 (issued Mar 2020).

Magazine Articles

- [M1] Ramani, K.S., **Duan, M.**, Yoon, D., Okwudire, C.E. and Ulsoy, A.G., 2018, “Boosting speed and accuracy in precision motion control,” *Mechanical Engineering Magazine Select Articles*, 140(09), pp. S17-S23.

Teaching Experience

HKUST

- MECH 2520^[L,AI]: Design and manufacturing I Spring 2022–2026
- MECH 4000S^[N,L,AI]: Intelligent control and data-driven modeling of dynamic systems Fall 2025
- MECH 6910T^[N,L,AI]: Data-driven modeling and control of dynamic systems Fall 2023, 2024
- MECH 6910S^[N,L,AI]: Advanced additive manufacturing and topology optimization Fall 2022
- MECH 4000O^[N,L]: Introduction to additive manufacturing and rapid prototyping Fall 2021
- MECH 4900^[L]: Final year design project (6 groups, 20 students in total) 2021–2026
 - 2021–2022: “Design, manufacturing, modeling, and control of a cable-driven robot for additive manufacturing” (won **IMechE Best Student Design Award** and **ASM Technology Award**)
 - 2022–2023: “Active vibration isolation with piezo actuators,” (Industrial-initiated Project with ASMPT Limited)
 - 2022–2023: “Design and manufacture a CNC milling machine”
 - 2023–2024: “A cable-driven bionic robotic hand design, manufacturing, and control” (won **IMechE Best Student Design Award**)
 - 2024–2025^[AI]: “A smart and autonomous wheel-leg robot design, modeling, and control”
 - 2025–2026^[AI]: “Collaborative multi-robot system for deformable cable manipulation and assembly”

^[N] New course with comprehensive syllabus and course design.

^[L] Contains laboratory and hands-on components.

^[AI] Serves MAE+AI initiative.

Teaching Innovation Fund

- Center for Education Innovation (CEI), Teaching and Learning Innovation Projects Fund, 153E-2223, “Online Interactive Mechanical Design Playground and Gallery,” (2022–2024), HK\$ 241,500, Leading, PI (implemented in MECH 2520, Spring 2023–2026).

University of Michigan

- AE 543: Structural Dynamics (Co-taught with Prof. Carlos E.S. Cesnik) Spring 2019
- AE 470: Dynamics and Control in Aerospace Applications (Guest Lecturer) Spring, Fall 2019

Completed Graduate Student Supervision

Served as Supervisor (5 PhD Students)

- Zhou, Yi, PhD, “Construction Robot Planning, Estimation, and Control in Challenging Environments” (Sep 2022 – May 2026)
- Liu, Shuai, PhD, “Design, Dynamic Modeling, Planning, and Control of Reconfigurable Cable-Driven Robotic System” (Sep 2022 – May 2026)
- Yang, Yuexin, PhD, “Multi-Axis Additive Manufacturing with Continuous Fiber: Design Optimization, Structure Tailoring, and Process Control” (Sep 2022 – Jul 2026)
- Dong, Boge, PhD, “Model-Based Dynamic Load Alleviation and Uncertainty-Aware Distributed Sensing of Aeroelastic Structure” (Sep 2022 – Aug 2026)
- Chen, Siqi, PhD, “Control-Oriented Modeling, In-Situ Monitoring, and Dynamic Compensation of Material Extrusion and Magnetic-Assisted Directed Energy Deposition Processes” (Sep 2022 – Aug 2026)

Served as Co-supervisor (5 PhD and 3 MPhil Students)

- Bi, Danjie, PhD, “Process Planning Optimization for Layer-wise Additive Manufacturing” (Sep 2021 – Jul 2024; Main Supervisor: Tang, Kai, HKUST(GZ))
- Lu, Xiaohan, MPhil, “Development of Novel Generalized Gaussian Processes and Materials Science” (Sep 2022 – Jul 2024; Main Supervisor: Wang, Wenjia, HKUST(GZ))
- Song, Cheng, MPhil, “A Cox partially linear model for panel count data with kernel ridge regression” (Sep 2022 – Jul 2024; Main Supervisor: Wang, Wenjia, HKUST(GZ))
- Li, Tao, PhD, “Design, Modeling, and Development of Autonomous Surface Manipulator Systems for Ocean Manufacturing” (Sep 2021 – May 2025; Main Supervisor: Cai, Yi, HKUST(GZ))
- Zhang, Yun, PhD, “Knowledge Distillation for Generative Models” (Sep 2021 – Jun 2025; Main Supervisor: Wang, Wenjia, HKUST(GZ))
- Zhang, Jing, PhD, “Contributions to Offline Reinforcement Learning: Mitigating Distribution Shift and Enhancing Goal-Conditioned Learning” (Sep 2021 – Jun 2025; Main Supervisor: Wang, Wenjia, HKUST(GZ))
- Shi, Lin, MPhil, “Material Removal Modeling and Reinforcement Learning Based Process Parameter Optimization for Robotic Grinding” (Sep 2024 – Jul 2026; Main Supervisor: Hu, Pengcheng, HKUST(GZ))
- Zhang, Wenze, PhD, “Intelligent Morphology Prediction and Process Optimization for Laser Directed Energy Deposition” (Sep 2022 – Jul 2026; Main Supervisor: Tang, Kai, HKUST(GZ))

Internal Service at HKUST

MAE Department Service

• Local HD/AD recruitment committee member	2025–2027
• MSc in MESF committee member	2025–2027
• PG recruitment and admission committee member	2024–2027
• Student team competitions committee member	2023–2026
• Search and appointments committee member	2024–2026
• JUPAS recruitment committee member	2024–2026
• Resource committee member	2024–2025
• Direct entry recruitment committee member	2024–2025
• Red Bird Racing Team (EVRT) supervisor	2023–2025
• Industrial engagement committee MAE representative	Mar 2024
• UG students briefing in Engineering + AI majors MAE representative	2022–2023

Other University Unit Service

• Cheng Kar-Shun Robotics Institute (CSKRI) executive committee member	2026–present
• MEng Program on Robotics and Embodied AI co-developer	2026–present
• BEng in Robotics and AI Program (in planning) co-developer	2026–present
• Research Center on Smart Manufacturing associate head	2023–present
• UROP supervisor of 23 enrolments with 16 distinct UG students	2023–present
• PhD qualifying exams (PQE) examiner of 44 PhD candidates	2021–present
• Thesis exam panel member of 47 PhD and MPhil students	2021–present
• OKT technology review committee member (257th, 268th, 279th, 286th, 292nd, 293rd review meetings)	2023–2026
• SENG JEE recruitment student mingling event faculty member	Jun 2026
• CSKRI Industrial Summit organization committee member	Jun 2026
• MAE head search committee member	2024–2025
• HKUST undergraduate program webinar series speaker	Nov 2025
• Working group member for HKUST(GZ) UG program on smart manufacturing	2025
• Innovation and engineering thought leader forum keynote speaker	Aug 2024
• Exchange session with universities in Hong Kong and China Aerospace Science and Technology Corporation HKUST representative	Jan 2024
• Undergraduate Student-Initiated Experiential Learning (USEL) supervisor of a team of 5 UG students	2023
• Mainland Joint Entrance Examination interview session panel member	Jun 2022

External Service

Academic Conference Service

• 2027 IEEE/ASME Advanced Intelligent Mechatronics (AIM) organization committee member and workshop co-chair	2026-2027
• 2026 IEEE/ASME AIM associate editor	2026
• 1st National Smart Composite and Additive Manufacturing Symposium organization committee member and session chair	2025
• 2026 ASME MSEC Intelligent Sensing, Analytics, and Control for Manufacturing Processes symposium organizer	2025-2026
• 2025 ASME MSEC Smart Additive Manufacturing symposium organizer and session chair	2025
• 2025 Smart and Advanced Manufacturing Symposium organizer and chair	2025
• 2024 ASME MSEC Smart Additive Manufacturing symposium organizer	2024

- 2023 IEEE CASE session chair Aug 2023
- 2023 ASME MSEC session chair Jun 2023

Professional Review Service

- Paper reviewer, 147 verified reviews for 30 journals/conferences ([Web of Science](#)). 2014–present
Selected journals: IEEE/ASME Trans. Mechatronics (30), Composites Part A (14), IEEE Trans. Ind. Electron. (12), Computer-Aided Design (8), Precision Engineering (8), Aerospace (7), IEEE Trans. Autom. Sci. Eng. (7), J. Manuf. Sci. Eng. (5), Mechatronics (5).
- Hong Kong Research Institute of Textiles and Apparel (HKRITA) platform project on Automated Sewing System review committee member Jul 2026
- HKRITA project on Robotic Recycling System review committee member Jun 2024
- HKRITA ITC project ITP/066/22TP, Development of Robust Electrostatic Gripper for Fabric Manipulation in Manufacturing project chair 2023–2024
- HKRITA platform projects on robotic manipulation and inspection systems review committee member 2022–2023

Voluntary External Teaching Service

- Summer Course in Advanced Manufacturing Technology (organized by State Key Laboratory of Ultra-precision Machining Technology) lecturer on “Additive Manufacturing and Topology Optimization” Aug 2023, 2024, 2026
- Davis Aerospace Technical High School guest lecturer on “Aerospace Structure and Manufacturing” Fall 2020

Presentations and Talks

Manufacturing Topics

- [T1] ASME Manufacturing Science and Engineering Conference (MSEC), *Contributed*, “Design and Multi-Axis Additive Manufacturing of Lightweight and Skin Compatible Mesh Splints Using Continuous Basalt Fiber for Rehabilitation,” State College, US, Jun 2026.
- [T2] 1st National Smart Composite and Additive Manufacturing Symposium, *Invited*, “Multi-axis Path Planning and Contact Force Real-time Feedback in Additive Manufacturing with Continuous Fiber,” Shenzhen, CN, Dec 2025.
- [T3] MSEC, *Contributed*, “Contact-Force-Based Closed-Loop Control of Multi-Axis Additive Manufacturing with Continuous-Fiber-Reinforced Polymer,” Greenville, US, Jun 2025.
- [T4] MSEC, *Contributed*, “Additive Manufacturing with Continuous Fiber: A Comparison between Prepreg and In-Situ Impregnated Fiber on Printing Accuracy, Bonding, and Mechanical Performance,” Greenville, US, Jun 2025.
- [T5] Smart and Advanced Manufacturing Symposium 2025, *Plenary*, “Additive Manufacturing with Continuous Fiber: Design, Monitoring, and Control,” Hong Kong SAR, CN, Mar 2025.
- [T6] Oriental Energy Technology Symposium (Oriental Energy Company), *Plenary*, “Additive Manufacturing with Continuous Fiber: Design, Monitoring, and Control,” Guangzhou, CN, Aug 2024.
- [T7] MSEC, *Contributed*, “Dynamic geometric modeling for directed energy deposition process,” Knoxville, US, Jun 2024.
- [T8] IEEE International Conference on Advanced Robotics and Its Social Impacts (ARSO), *Invited*, “Sustainable robotic-based additive manufacturing with continuous fiber,” Hong Kong SAR, CN, May 2024.
- [T9] Silk Road Frontier Forum (Chinese Academy of Sciences), *Plenary*, “Additive Manufacturing with

Continuous Fiber: Design, Monitoring, and Control,” Urumqi, CN, Dec 2023.

- [T10] Chinese Control Conference (CCC), *Contributed*, “A Physics-Guided Data-Driven Feedforward Tracking Controller for Systems with Unmodeled Dynamics - Applied to 3D Printing,” Tianjin, CN, Jul 2023.
- [T11] MSEC, *Contributed*, “Continuous Fiber Path Optimization in Composite Additive Manufacturing via a Finite Element Model with B-spline Fiber Parameterization,” New Brunswick, US, Jun 2023.
- [T12] International Conference on Advances in Design, Materials and Manufacturing Technologies (ICADMMT), *Plenary*, “Modeling and Trajectory Optimization in Additive Manufacturing of Continuous-Fiber-Reinforced Materials,” Hong Kong SAR, CN, Oct 2022.
- [T13] Li Ning-HKUST Symposium (HKUST Sports Institute), *Invited*, “Tailoring structural responses of rackets for the athletes’ needs: manufacturing, monitoring, and analysis innovations,” Hong Kong SAR, CN, May 2022.
- [T14] UoS-HKUST Joint Workshop on Advanced Manufacturing (HKUST, University of Strathclyde), *Invited*, “Additive Manufacturing of Fiber-Reinforced Material,” Hong Kong SAR, CN, Oct 2021.

Robotics Topics

- [T15] HKUST-BYD Joint Technical Symposium, *Plenary*, “Dual-Arm Manipulation of Cable Harness Assembly,” Hong Kong SAR, CN, Aug 2026.
- [T16] Googol Tech Summit, *Plenary*, “Feedforward and Feedback Intelligent Motion Control in Feed Drive and Robotic Applications,” Dongguan, CN, Jul 2026.
- [T17] Robotics: Science and Systems (RSS) 2026 Workshop, *Contributed*, “Where Did I Touch? Learning Surface-Block Tactile Representations for Single-Shot Contact Localization,” Sydney, AU, Jul 2026.
- [T18] International Conference on Robotics and Automation (ICRA), *Contributed*, “InvariantCloud: A Globally Invariant, Uniquely Indexed Point Cloud Framework for Robust 6-DoF Tactile Pose Tracking,” Vienna, AT, Jun 2026.
- [T19] BDR-HKUST Symposium, *Invited*, “Bricklaying Robot Planning and Dynamic Position-Force Control,” Foshan, CN, May 2025.
- [T20] BYD-HKUST Symposium, *Plenary*, “Hybrid Robotic System Design, Fabrication, and Intelligent Monitoring and Control,” Shenzhen, CN, Sep 2024.
- [T21] IEEE/ASME International Conference on Advanced Intelligent Mechatronics (AIM), *Contributed*, “Vibration compensation of an Extendable Variable-Stiffness Boom-Lift-Mounted Robot,” Boston, US, Jul 2024.
- [T22] Robotic Technology Summit (Huashu Robotics), *Plenary*, “Control-Enabled Vibration Compensation,” Foshan, CN, Dec 2023.
- [T23] IEEE International Conference on Automation Science and Engineering (CASE), *Contributed*, “Design, manufacturing, modelling, and control of a cable-driven parallel robot for additive manufacturing,” Auckland, NZ, Aug 2023.
- [T24] Future of Railway: The Smart Way Forward (HKUST $\times$ MTR Joint Lab), *Plenary*, “Robots and Digital Twins for MTR Inspection and Maintenance Challenges,” Hong Kong SAR, CN, May 2023.
- [T25] Business of IP Asia Forum (Trade Development Council), *Invited*, “Construction Robots and Additive Manufacturing Automation Innovations,” Hong Kong SAR, CN, Dec 2022.
- [T26] Frontier Technologies Seminar Series (HKUST-BDR Joint Research Institute), *Invited*, “Control of flexible construction robots with vibration compensation and over-actuation,” Hong Kong SAR, CN, Feb 2022.

Aerospace Topics

- [T27] LAERC-LASERi Joint Forum (organized by HKUST Low Altitude Economy Research Center), *Plenary*, “Aeroelastic Modeling, Load Alleviation, and Wind-Resistant Flight Control for Safe

UAV Operations,” Guangzhou, CN, Aug 2026.

- [T28] Hong Kong Innovation and Technology Achievements Pilot Conference (organized by Aviation Industry Corporation of China, AVIC), *Invited*, “Modeling, Monitoring, and Control of Aeroelastic Structures,” Shenzhen, CN, Dec 2025.
- [T29] IEEE International Conference on Control Science and Systems Engineering (ICCSSE), *Contributed*, “Optimal Trajectory Generation and Feedback Tension Control of a Robotic Space Tether Launching System,” Beijing, CN, Oct 2025.
- [T30] COMAC International Science and Technology Innovation Week, *Keynote*, “Aeroelasticity-Oriented Modeling, Design Optimization, and Control,” Shanghai, CN, Aug 2024.
- [T31] APSCO-HKUST Symposium (Asia-Pacific Space Cooperation Organization), *Invited*, “From Construction Robots to Lunar Surface Construction,” Hong Kong SAR, CN, Jan 2024.
- [T32] CAST × Hong Kong Academia Symposium (China Academy of Space Technology), *Plenary*, “HKUST’s Space Explorations and Relevant Technologies,” Hong Kong SAR, CN, Jan 2024.

Education and Other Generic Topics

- [T33] Global Talent Summit, *Plenary*, “Hong Kong’s Innovation and Technology Ecosystem Empowering Young Talent for High-Quality Development,” Hong Kong SAR, CN, Mar 2026.
- [T34] Science and Engineering Thought Leaders Forum, *Plenary*, “Research and Education Innovations in Smart Automation for Hong Kong’s Economy,” Hong Kong SAR, CN, Oct 2024.
- [T35] Virtual Teaching and Learning Innovation Expo in the Metaverse, *Contributed*, “Undergraduate Mechanical Design Education via a Virtual Interactive Platform,” Hong Kong SAR, CN, Jun 2023.
- [T36] International Conference on Learning and Teaching for Future Readiness (EdUHK), *Invited*, “Undergraduate Mechanical Design Education via a Virtual Interactive Platform,” Hong Kong SAR, CN, May 2023.