

YAYUN DU

Web: <https://yayundu.com/>

Email: duyayun1hit@yahoo.com.hk

Github: github.com/duyayun

Address: 420 Westwood Blvd, 15-155 Engr IV

Los Angeles, CA 90095-1597

fluid-structure interaction
Control
Artificial Intelligence
Circuit
Design
robotics
buckling
learning
Flagella
Optimization
biomechanics

PROFILE HIGHLIGHTS

- ❑ **Publications and Patent:** Published or submitted five first-authored articles and two co-authored articles in top journals and conference proceedings in robotics. Several more are in preparation. Submitted an invention disclosure to UCLA.
- ❑ **Mentorship and Inclusion:** Supervised twelve undergraduate students, including four female students and two community college transfer students. Co-authored peer reviewed papers with eight supervisees. Out of these supervisees, Zihang Zhao later joined UCLA as a PhD student, Andrew Miller received graduate admission offers from Stanford, UCLA and Georgia Tech for Fall 2021, and Jingyi Chen joined Cornell as a graduate student. Bhruhu Mallajosyula joined General Motors and Angeline Liu joined JPL.
- ❑ **Grant Writing:** Gathered preliminary data for a successful \$450k federal grant from US Department of Agriculture. Prepared ~ 33% of an NSF proposal with four PIs (\$1.2M) that received ratings of Very Good, Very Good, Very Good/Good, and Fair (eventually declined).
- ❑ **Teaching and Leadership:** Received an average student evaluation score of 8.0/9.0 in five courses from five departments. Co-founder of Student Researchers United (SRU) at UCLA to waive nonresidential fees for international researchers and advocates for them.

EDUCATION

University of California, Los Angeles, CA

Ph.D. (Mechanical Engineering)

Major: System and Control

Minor: Structural and Solid Mechanics

M.S. (Mechanical Engineering)

GPA:3.74/4.0

Dec 18 - Present

Sep 16 - Feb 18

Harbin Institute of Technology, Heilongjiang, China

B.S.E. (Automotive Engineering)

Ranking: 1/144

Sep 12 - July 16

RESEARCH EXPERIENCE

Structure-Computer Interaction Lab, UCLA, Los Angeles, CA

Graduate Research Assistant

Research area: robot design and control, biolocomotion, learning, agriculture robot, computer vision

April 18 - present

Advisor: Prof. M. Khalid Jawed

New Energy Vehicle Research Institute, Harbin Institute of Tech, Harbin, China

Assistant in Research

Research area: distributed vehicle system control, alternative fuel vehicle

Jul 14 - Aug 16

Advisor: Prof. Dafang Wang

TECHNICAL EXPERIENCE

FAW Jiefang Automotive Co., Ltd., Changchun, China

Engineering Assistant Intern

Jan 16 - Mar 16

Zhengzhou Nissan Motor Company, Zhengzhou, China

Engineering Assistant Intern

Jan 14 - Mar 14

PEER-REVIEWED PUBLICATIONS & PROCEEDINGS

Note: In the field of robotics, it is customary to publish impactful works in peer reviewed conference proceedings instead of journals.

indicates students supervised or mentored by Yayun Du.

- P1. **Du, Y.**, A., Miller[#], Jawed, M. K., “Simple Flagellated Soft Robot for Locomotion near Air-Liquid Interface”, *IEEE International Conference on Soft Robotics (RoboSoft)*, Yale, CT, 2021 (*In press*)
URL: <https://arxiv.org/abs/2103.05712>
- P2. **Du, Y.**, Deng, Z. [#], Fang, Z.[#], Wang, Y.[#], Nagata, T.[#], Bansal, K., Quadir, M., Jawed, M. K., “Vision and force based autonomous coating with rollers”, *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, Las Vegas, NV, USA, pp. 9954-9960, 2020
URL: <http://doi.org/10.1109/IROS45743.2020.9341619>
- P3. Qin, L., Huang W., **Du, Y.**, Zheng, L., “Genetic algorithm-based inverse design of elastic gridshells”, *Structural and Multidisciplinary Optimization*, 62(5), pp.2691-2707, 2020.
URL: <https://doi.org/10.1007/s00158-020-02639-8>
- P4. Wang, D., Zhou, C., Zou, M., Liao, J., **Du, Y.**, “Study on Inspection of the Initial Rotor Position of BLDC Based on High-frequency Signal Injection”, *IEEE Transportation Electrification Conference and Expo Asia-Pacific*, pp. 1-4, 2014.
URL: <https://doi.org/10.1109/ITEC-AP.2014.6940758>
- P5. **Du, Y.**, Lam, J.,[#], Sachanandani K.[#], Jawed, M. K., “Modeling the locomotion of articulated soft robots in granular medium”, Submitted to *the International Journal of Robotics Research*, 2021.
URL: <https://arxiv.org/abs/2103.03993>
- P6. **Du, Y.**, Zhang, G.,[#], Tsang D.[#], Jawed, M. K., “Deep-CNN based real-time robotic multi-class weed identification”, *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2021. (*Submitted*)
URL: <https://youtu.be/ci66YtdtfQk>
- P7. **Du, Y.**, Mallajosyula, B.[#], Sun, D.[#], Chen, J.[#], Zhao, Z.[#], Rahman, M., Quadir, M., Jawed, M. K., “Compact mobile robot for precision weed management in row crops”, *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2021. (*Submitted*)
URL: <https://youtu.be/QjwI7DM3CIg>

CONFERENCE PROCEEDINGS AND PRESENTATIONS

- C1. **Du, Y.***, Miller, A., Jawed, M. K., “Simple untethered flagellated robot in fluids and granular media”, American Physical Society March Meeting, Online, March 14-19, 2021. (*Oral*)
- C2. **Du, Y.***, Deng, Z. , Fang, Z., Wang, Y., Nagata, T., Bansal, K., Quadir, M., Jawed, M. K., “Vision and force based autonomous coating with rollers”, International Conference on Intelligent Robots and Systems (IROS), Online, Oct 25, 2020. (*Oral*)
- C3. **Du, Y.***, Lam, J., Sachanandani K., Jawed, M. K., “Locomotion of Soft Robots with Flexible Flagella in Granular Medium”, 1st Southern California Mechanics Workshop, San Diego, CA, Jan 2020. (*Oral*)
- C4. **Du, Y.***, Lam, J., Sachanandani K., Jawed, M. K., “Locomotion of Soft Robots with Flexible Flagella in Granular Medium”, American Physical Society March Meeting, Boston, MA, March 4-8, 2019. (*Oral*)
- C5. Qin L.*, **Du, Y.**, Huang, W., Jawed, M. K., “Numerical Simulations for Physics-based Training of Robots for Manipulation of Flexible Rods”, American Physical Society March Meeting, Boston, MA, March 4-8, 2019. (*Oral*)
- C6. **Du, Y.***, Jawed, M. K., “Locomotion of Soft Robots with Flexible Flagella in Granular Medium”, Southern California Robotics Symposium, Caltech, CA, April 2019. (*Poster*)

GRANT WRITING

- G1. Collected preliminary data for Grant # 2021-67022-34200, “Autonomous Robotic Systems for Precision Weed Control in Flax”, National Institute of Food and Agriculture, **United States Department of Agriculture**, \$453,190, 2021 - 2025. PIs: Mukhlesur Rahman and Mohi Quadir (North Dakota State University), M. Khalid Jawed (UCLA)
- G2. Wrote $\sim 33\%$ of the project narrative for a proposal titled “Smart and Connected Robotic Infrastructure for Data-driven Sustainable Agriculture”, **National Science Foundation**, \$1.2M, 2021. PIs: Rajit Gadh (UCLA), M. Khalid Jawed (UCLA), Wei Wang (UCLA) and Mukhlesur Rahman (North Dakota State University), M. Khalid Jawed (UCLA). Received ratings of (1) Very Good, (2) Very Good, (3) Very Good/Good, and (4) Fair; but eventually declined.

PROFESSIONAL SERVICE

Reviewer

- ☐ Three papers for IEEE International Conference on Robotics and Automation (ICRA), 2021
- ☐ Five papers for IEEE International Conference on Intelligent Robots and Systems (IROS), 2021

Professional membership

- ☐ American Physical Society
- ☐ Institute of Electrical and Electronics Engineers

ADVISING AND MENTORING EXPERIENCE

Undergraduate Student Research Program (SRP) 199 : Wenjie Mo, Chenda Duan, Yu Zhou, Guofeng Zhang, Darren Tsang, “Low-cost autonomous agricultural robot for weed control” , 2020-2021

Undergraduate Student Research Program (SRP) 199 : Andrew Miller, Arthur Lovekin, “Bacteria-inspired flagellated robot turn by buckling soft tails” , 2019-2021

Undergraduate Student Research Program (SRP) 199 : Keerthi Pradaa Balajee, “Bacteria-inspired soft robot capable of traveling through granular media” , 2019

Undergraduate Student Research Program (SRP) 199 : Taiki Nagata, “Collaborative robotic drawing simulation in Vrep with constant force” , 2019

Undergraduate Student Research Program (SRP) 99 : Karunesh Schanandani, Jacqueline Lam, “2D movement control of soft robots in low Reynolds number of fluid” , 2019

Undergraduate Summer Intern : Zihang Zhao, Visiting Undergraduate Student, “Build a compact agriculture robot for weed control” , 2019

TEACHING AND LEADERSHIP EXPERIENCE

Department of Electrical Engineering, UCLA, Los Angeles, CA Sep 17 - Sep 20
Teaching Associate for *ECE 205A Matrix Analysis for Scientists and Engineers* (Graduate)
Student evaluation: **8.0/9.0**

Department of Mechanical Engineering, UCLA, Los Angeles, CA Sep 17 - Sep 20
Teaching Assistant for *M20 Introduction to Computer Programming with MATLAB* (Undergraduate)
Student evaluation: **8.0/9.0**

Department of Physics & Astronomy, UCLA, Los Angeles, CA Mar 18 - Jun 18
Teaching Assistant for *Physics 5C Physics for Life Sciences Majors: Electricity, Magnetism, and Modern Physics*
Physics 1C Physics for Scientists and Engineers: Electrodynamics, Optics, and Special Relativity (Undergraduate)
Student evaluation: **8.0/9.0**

Department of Psychology, UCLA, Los Angeles, CA

Sep 17 - Sep 19

Teaching Assistant for *Psychology 120B Sensation & Perception* (Undergraduate)

Student evaluation: **8.0/9.0**

Co-founder of Student Researchers United (SRU), UCLA, Los Angeles, CA

Feb 21 -

Fight for waiving nonresidential fee in UC system for incoming international students

Advocate for and provide legal resources and peer support to international researchers

Yuan • Meng Tibet, Tibet, China

Jun 13 - Sep 13

Team Creator and Leader of the first volunteer team at HIT to teach in Tibet

SELECTED HONORS AND AWARDS

GRADUATE

2018-2021 **Graduate Division Fellowship** from UCLA Graduate Division (\$ 49,097.72 per year)

2016 **Best Passage Award** from UCLA Graduate Division for sharing the story “How I get to UCLA”

UNDERGRADUATE

2012-2016 **National Scholarship** from Ministry of Education of the People’s Republic of China with first GPA ranking for four years in Department of Automotive Engineering

2015 **Top Ten Students** of Harbin Institute of Technology, Weihai for combined top 1% GPA, excellent publications and outstanding leadership evaluated by classmates and staff in the department. I was the only junior gaining this honor while others were seniors

2015 **Honorable Mention** from COMAP for Mathematical Contest in Modeling (MCM)

2015 **Outstanding Leader Award** from Harbin Institute of Technology for academic excellence and fantastic student club activity organization

2014 **Best-organized Volunteer Team Leader** from Harbin Institute of Technology for establishing the first volunteer team of college students to teach in Tibet and building long-term cooperation with the local government

2013 **First Prize** from Heilongjiang Provincial Education Department in Mathematics Competition for College Students; 8% of students were awarded in 2013

2013 **First Prize** from College Foreign Language Teaching Committee and College Foreign Language Teaching Research Association in National English Competition for College Students; 6% of students were awarded in 2013

2013 **Most Creative Award** from Department of Automotive Engineering for the lowest cost and most efficient pressure oil pump design; 1 out of 10 teams was awarded

TECHNICAL SKILLS

Programming: MATLAB, Python, C/C++, ROS, HTML, JavaScript, Lua

Modeling & Designing: CATIA, Solidworks, AutoCAD, Mathematica, COMSOL, Simulink/Carsim, Davinci Resolve

Languages: English, Chinese, Korean

REFERENCES

□ M. KHALID JAWED

Assistant Professor of Mechanical Engineering

University of California, Los Angeles, Los Angeles, CA, 90095, US

Phone: +1(310) 206-5453

Email: khalidjm@seas.ucla.edu

□ MUKHLESUR RAHMAN

Associate Professor of Plant Sciences

North Dakota State University, Fargo, North Dakota, ND, 58105, US

Email: md.m.rahman@ndsu.edu

- MOHI QUADIR
Assistant Professor of Coatings and Polymeric Materials
North Dakota State University, Fargo, North Dakota, ND, 58105, US
Email: mohiuddin.quadir@ndsu.edu
- ALAN LAUB
Distinguished Emeritus Professor of Electrical and Computer Engineering
University of California, Los Angeles, Los Angeles, CA, 90095, US
Phone: +1(310) 825-4245
Email: laub@ee.ucla.edu
- DAFANG WANG
Professor of Automotive Engineering
Harbin Institute of Technology, Weihai, Weihai, Shandong Province, 264209, China
Phone: +8613863009863
Email: wangdf@hit.edu.cn

Last updated: April 9, 2021