C U R R I C U L U M   V I T A E

Kaiyan Yu

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EDUCATION

Ph.D. *Mechanical and Aerospace Engineering, Rutgers University*   *October 2017*

B.S.   *Intelligent Science and Technology, Nankai University (China)*   *July 2010*

RESEARCH INTERESTS

- Dynamic systems and controls
  - ▷ dynamic systems modeling and control
  - ▷ mechatronic systems and control
  - ▷ nonlinear, robust, and adaptive control system design
- Autonomous robotic systems
  - ▷ autonomous vehicles/robots
  - ▷ motion planning, navigation and control
  - ▷ human/robot interactions
- Automation science and engineering
  - ▷ automation for micro-/nano-systems
  - ▷ nano/micro particles control and manipulation
  - ▷ intelligent autonomous system

HONORS/AWARDS

- Services for Students with Disabilities Student Recognition Recipient, *Binghamton University*, 2023
- My class, ME 428, has been selected as one of the 34 Cool Classes at Binghamton University, *Binghamton University Blog*, 2022
- Best Student Paper Award, *2022 IEEE International Conference on Automation Science and Engineering*
- NSF Doctoral Consortium Award, *2016 IEEE Conference on Automation Science and Engineering*
- Best Student Paper Award Finalist [1], *2014 IEEE/ASME International Conf. on Advanced Intelligent Mechatronics*
- "Hundred Reserve Young Teachers" program, Nankai University, 2010
- Graduate with Highest Honor, Nankai University, 2010
- Best Undergraduate Thesis, Nankai University, 2010
- National Scholarship/Followship, Nankai University, 2008-2009
- Wumart Science Masters Scholarship/Followship, Nankai University, 2007-2008
- First Prize of Excellent Undergraduate Scholarship/Followship, Nankai University, 2006-2007

TEACHING EXPERIENCE

- **Instructor**
  Department of Mechanical Engineering, Binghamton University
  - ▷ **ME 528**: Modern Robotics, New Graduate Course   *Fall 2018, Fall 2019, Fall 2020, Spring 2022, Spring 2023, Spring 2024*

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[1]Due to visa application issue, I did not attend and participate the best paper competition at 2014 AIM in France.

- ▷ **ME 424**: Control System in Mechanical Engineering, Undergrad Core Course   *Spring 2019,Spring 2020, Spring 2021, Fall 2021, Fall 2022, Fall 2023*
- ▷ **ME 428**: Robotics, Undergrad Tech Elective *Spring 2018, Spring 2020, Spring 2021, Spring 2022, Spring 2023, Spring 2024*

  Department of Mechanical and Aerospace Engineering, Rutgers University

- ▷ **MAE 221**: Engineering Mechanics: Statics, Undergrad Core   *Summer 2016*

- **Teaching assistant/lab instructor**
  Department of Mechanical and Aerospace Engineering, Rutgers University

  - ▷ **Byrne Freshmen Seminar**: Robotics: The past, the present, the future   *Spring 2016, Spring 2017*

  - ▷ **MAE 361**: Introduction to Mechatronics   *Spring 2012, Spring 2013, Spring 2014*

  Institute of Robotics and Automatic Information System, Nankai University   *Spring 2011*

  - ▷ An Introduction to Robotics

- **Lecturer**
  ChuangYuan Information Technology Club, Nankai University   *2008–2009*

  - ▷ C++ Programming Language
  - ▷ Computer Graphic Design

RESEARCH EXPERIENCE

- **Assistant professor**   *January 2018 – present*
  Department of Mechanical Engineering, Binghamton University
- **Research associate**   *December 2017*
  Department of Mechanical and Aerospace Engineering, Rutgers University
- **Graduate research assistant**   *September 2011 – September 2017*
  Department of Mechanical and Aerospace Engineering, Rutgers University
- **Undergraduate and graduate research assistant**   *July 2008 – July 2011*
  Institute of Robotics and Automatic Information System, Nankai University
- **Cross-disciplinary Scholars in Science and Technology (CSST)**   *July 2009-September 2009*
  Computer Science Department, University of California, Los Angeles

PUBLICATIONS [2]

- **Book chapters**

  B1. **K. Yu** (2022). Electrophoresis-based manipulation of micro- and nanoparticles in fluid suspensions, In *Field-Driven Micro and Nanorobots for Biology and Medicine*, Y. Sun, X. Wang, and J. Yu (Ed.), Springer Nature, Switzerland, pp 133-164.

- **Refereed journal papers that have appeared or been accepted**

  J19. V. Veeraraghavan, K. Hunte, J. Yi[†], and **K. Yu**[†] (2024). Complete and near-optimal robotic crack coverage and filling in civil infrastructure. *IEEE Trans. on Robotics*, in press.

  J18. J. Song, J. Wu, and **K. Yu**[†] (2024). Learning-based auto-focus and 3D pose identification of moving micro- and nanowires in fluid suspensions. *IEEE Trans. on Automation Science and Engineering*, in press.

  J17. A. Arab, **K. Yu**, J. Yu, and J. Yi[†] (2023). Motion planning and control of autonomous aggressive vehicle maneuvers. *IEEE Trans. on Automation Science and Engineering*, vol. 21, no. 2, pp. 1488-1500.

  J16. J. Wu and **K. Yu**[†] (2023). Adaptive tube model predictive control for manipulating micro- and nanoparticles in fluid suspensions under global external fields. *IEEE Trans. on Automation Science and Engineering*, vol. 20, no. 3, pp. 1838-1850.

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[2]Underlined authors are graduate students or undergraduate students under my supervision. The name with a "†" symbol indicates the corresponding author.

J15. X. Li, J. Wu, J. Song and **K. Yu**[†] (2022). Informed sampling-based motion planning for manipulating multiple micro agents using global external electric fields. *IEEE Trans. on Automation Science and Engineering*, vol. 19, no. 3, pp. 1422-1433.

J14. Y. Zhang, J. Xu, P. Zhang, W. Li, **K. Yu** and P. Huang[†] (2022). Monocular visual-inertial sensing of unknown rotating objects: observability analyses and case study for metric 3D reconstructing of space debris. *IEEE Robotics and Automation Letters*, vol. 7, no. 2, pp. 2423-2430.

J13. J. Wu, X. Li, and **K. Yu**[†] (2020). Electrophoresis-based adaptive manipulation of nanowires in fluid suspension. *IEEE Trans. on Mechatronics*, vol. 25, no. 2, pp 638-649.

J12. H. Xiang, M. Trkov, **K. Yu** and J. Yi[†] (2019). A stick-slip interactions model of soft-solid frictional contacts. *ASME Journal of Dynamic Systems, Measurement and Control*, vol. 141, no. 4, pp 041015-041015-10.

J11. **K. Yu**[†], J. Yi, and J. Shan (2018). Real-time motion planning of multiple nanowires in fluid suspension under electric-field actuation. *International Journal of Intelligent Robotics and Applications*, vol. 2, no. 4, pp 383-399.

J10. **K. Yu**, J. Yi[†], and J. Shan (2018). Automated characterization and assembly of individual nanowires for device fabrication. *Lab on a Chip*, vol. 18, no. 10, pp 1494-1503.

J9. **K. Yu**, J. Yi[†], and J. Shan (2018). Simultaneous multiple-nanowire motion control, planning and manipulation under electric-fields in fluid suspension. *IEEE Trans. on Automation Science and Engineering*, vol. 15, no. 1, pp 80-91.

J8. X. Lu, **K. Yu**, Y. Zhang, J. Yi[†], J. Liu, and Q. Zhao (2017). Whole-body pose estimation in physical rider-bicycle interactions with a monocular camera and wearable gyroscopes. *ASME Journal of Dynamic Systems, Measurement and Control*, vol. 139, no. 7, pp 071005-071005-11.

J7. **K. Yu**, J. Yi[†], and J. Shan (2015). Motion planning and control of nanowires under electric fields in fluid suspension. *IEEE Trans. on Automation Science and Engineering*, vol. 12, no. 1, pp 37-49.

J6. X. Lu, J. Liu[†], **K. Yu**, Y. Li, and L. Sun (2014). Pose measurements using quaternion and Kalman filter. *High Technology Letters*, vol. 20, no. 2, pp 131-139.

J5. X. Lu, J. Liu[†], **K. Yu**, Y. Li, and L. Sun (2013). Uncalibrated visual servoing design for the competitive networked robots. *High Technology Letters*, vol. 19, no. 4, pp 413-421.

J4. **K. Yu**[†], J. Liu, X. Lu, H. Li, Y. Li, and L. Sun (2011). Design and implementation of simulation system for the competitive robot system. *Robot*, vol. 33, no. 6, pp 649-657 (in Chinese).

J3. X. Lu[†], J. Liu, **K. Yu**, H. Li, Y. Li, and L. Sun (2011). Rapid detection of moving target in the competitive networked robots. *Robot*, vol. 33, no. 6, pp 658-665,672 (in Chinese).

J2. J. Yu[†], **K. Yu**, X. Shi, and R. Peng (2009). Simultaneous determination of lead and zinc in copper concentrate by BP-artificial neural network spectrophotometry. *Metallurgical Analysis*, vol. 29, no. 3, pp 52-55.

J1. W. Chou[†], X. Lu, **K. Yu**, X. Liu, and S. Chen (2009). Indoor autonomous service robot system. *Automation & Instrumentation*, vol. 24, no. 9, pp 46-49 (in Chinese).

- **Refereed journal papers that are under review**

JS1. X. Li, S. Fang, and **K. Yu**[†] (2024). Time-optimal motion planning and control for autonomous vehicle: a beam theory-based approach with path smoothing and trajectory optimization. Submitted to *IEEE Trans. on Automation Science and Engineering*, under review.

- **Refereed conference papers that have appeared or been accepted**

C23. J. Wu and **K. Yu** (2023). Ensemble control for manipulating multiple nanowires in fluid suspension using external electrical fields. In *Proceedings of 2023 IEEE/ASME International Conference on Advanced Intelligent Mechatronics*, Seattle, WA, pp 105-110.

C22. J. Song, J. Wu, and **K. Yu** (2022). 3D pose identification of moving micro- and nanowires in fluid suspensions under bright-field microscopy. In *Proceedings of 2022 IEEE International Conference on Automation Science and Engineering*, Mexico City, Mexico, pp 987-992. (**Best Student Paper Award.**)

C21. J. Wu and **K. Yu** (2021). Adaptive tube model predictive control of micro- and nanoparticles in fluid suspensions using global external fields. In *Proceedings of 2021 IEEE/ASME International Conference on Advanced Intelligent Mechatronics*, Delft, Netherlands, pp 526-531.

C20. J. Song and **K. Yu** (2021). 3D pose identification of micro- and nanowires in fluid suspensions. In *Proceedings of 2021 IEEE International Conference on Automation Science and Engineering*, Lyon, France, pp 2092-2097.

C19. A. Joseph, J. Wu, **K. Yu**, L. Jiang, N. Cady, and B. Si (2021). Function-on-function regression for trajectory prediction of small-scale particles towards next-generation neuromorphic computing. In *Proceedings of*

2021 IEEE International Conference on Automation Science and Engineering, Lyon, France, pp 1997-2002.

C18. X. Li and **K. Yu** (2020). Informed sampling-based motion planning for manipulating multiple micro agents using global external fields. In *Proceedings of 2020 IEEE International Conference on Automation Science and Engineering*, Hong Kong, China, pp 889-894.

C17. J. Wu and **K. Yu** (2020). Electrophoresis-based adaptive tube model predictive control of micro- and nanoparticles motion in fluid suspension. In *Proceedings of 2020 IEEE/ASME International Conference on Advanced Intelligent Mechatronics*, Boston, MA, pp 2068-2073.

C16. J. Wu and **K. Yu** (2020). Adaptive tube model predictive control for manipulating multiple nanowires with coupled actuation in fluid suspension. In *Proceedings of 2020 IFAC World Congress*, Berlin, Germany, pp 8734-8739.

C15. J. Wu and **K. Yu** (2019). Adaptive control of nanowires motion using electric fields in fluid suspension. In *Proceedings of 2019 ASME Dynamic Systems and Control Conference*, Park City, UT, Paper # DSCC2019-9051.

C14. **K. Yu**, C. Guo, and J. Yi (2019). Complete and near-optimal path planning for simultaneous sensor-based inspection and footprint coverage in robotic crack filling. In *Proceedings of 2019 IEEE International Conference on Robotics and Automation*, Montreal, Canada, pp 8812-8818.

C13. **K. Yu**, J. Yi, and J. Shan (2018). Automated electric-field-based nanowire characterization, manipulation, and assembly. In *Proceedings of 2018 IEEE International Conference on Automation Science and Engineering*, Munich, Germany, pp 1612-1617.

C12. C. Guo, **K. Yu**, and J. Yi (2017). Optimal motion planning and control of a crack filling robot for civil infrastructure automation. In *Proceedings of 2017 IEEE International Conference on Automation Science and Engineering*, Xi'an, China, pp 1463-1468.

C11. **K. Yu**, J. Yi and J. Shan (2016). Time optimal simultaneously motion planning and manipulation of multiple nanowires under electric-fields in fluid suspension. In *Proceedings of 2016 IEEE International Conference on Automation Science and Engineering*, Dallas, TX, pp 954-959.

C10. A. Arab, **K. Yu**, J. Yi, and D. Song (2016). Motion planning for aggressive autonomous vehicle maneuvers. In *Proceedings of 2016 IEEE International Conference on Automation Science and Engineering*, Dallas, TX, pp 221-226.

C9. A. Arab, **K. Yu**, J. Yi, and Y. Liu (2016). Motion control of autonomous aggressive vehicle maneuvers. In *Proceedings of 2016 IEEE International Conference on Advanced Intelligent Mechatronics*, Banff, Canada, pp 1663-1668.

C8. **K. Yu**, J. Yi, and J. Shan (2015). Motion planning and manipulation of multiple nanowires simultaneously under electric-fields in fluid suspension. In *Proceedings of 2015 IEEE International Conference on Automation Science and Engineering*, Gothenburg, Sweden, pp 489-494.

C7. **K. Yu**, J. Yi and J. Shan (2014). Motion control and manipulation of nanowires under electric-fields in fluid suspension. In *Proceedings of IEEE/ASME International Conference on Advanced Intelligent Mechatronics*, Besançon, France, pp 366-371. (**Best Student Paper Award finalist.**)

C6. X. Lu, **K. Yu**, Y. Zhang, J. Yi, and J. Liu (2014). Whole-body pose estimation in physical rider-bicycle interactions with a monocular camera and a set of wearable gyroscopes. In *Proceedings of IEEE/RSJ International Conference on Intelligent Robots and Systems*, Chicago, IL, pp 4124-4129.

C5. **K. Yu**, X. Lu, J. Yi, and J. Shan (2013). Electrophoresis-based motion planning and control of nanowires in suspended fluids. In *Proceedings of 2013 IEEE International Conference on Automation Science and Engineering*, Madison, WI, pp 831-836.

C4. X. Lu, Y. Zhang, **K. Yu**, J. Yi, and J. Liu (2013). Body-segment orientation estimation in rider-bicycle interactions with an un-calibrated monocular camera and wearable gyroscopes. In *Proceedings of 2013 ASME Dynamic Systems and Control Conference*, Palo Alto, CA, DSCC2013-3839.

C3. Y. Li, X. Lu, **K. Yu**, and J. Liu (2011). Pursuit-evasion strategies of competitive networked robots based on differential games. In *Proceedings of the 30th Chinese Control Conference*, Yantai, China, pp 3947-3952 (in Chinese).

C2. X. Lu, J. Liu, **K. Yu**, H. Li, Y. Li, and L. Sun (2011). High precision and rapid pose measurement for the competitive networked robots. *Chinese Automation Congress*, Beijing, China.

C1. H. Li, J. Liu, Y. Li, X. Lu, **K. Yu**, and L. Sun (2010). Trajectory planning for visual servoing with some constrains. In *Proceedings of the 29th Chinese Control Conference*, Beijing, China, pp 3636-3642.

- **Refereed conference papers that are under review**

CS2. S. Fang, X. Li, and **K. Yu** (2024). Hybrid supervised physics informed neural networks for estimating

vehicle dynamics models. Submitted to *2024 Modeling, Estimation, and Control Conference*, under review.

CS1. A. Arab , Y. Mousavi, **K. Yu**, and I. B. Kucukdemiral (2024). Safety prioritization by iterative feedback linearization control for collaborative robots. Submitted to *2024 IEEE Conference on Control Technology and Applications*, under review.

- **Conference workshop contribution (poster/extend abstract reviewed)**

NC4. **K. Yu** (2018). Motion control, planning and manipulation of multiple nanowires under electric-fields in fluid suspension for automated characterization and nanoassembly. In *Poster Session at 30th annual Electronics Packaging Symposium*, Binghamton, NY.

NC3. **K. Yu**, J. Yi, and J. Shan (2018). Motion control, planning and manipulation of multiple nanowires under electric-fields in fluid suspension for automated characterization and nanoassembly. In *Workshop on 30 Years of Small-Scale Robotics: from Nano-, to Millimeter-Sized Robotic Systems and Applications at 2018 IEEE International Conference on Robotics and Automation*, Brisbane, Australia.

NC2. L. Wang, K. Yang, A. Dusane, M. Cotton, J. Xie, Y. Wang, X. Gong, S. Zhang, C. Yang, E. Kim, **K. Yu**, J. Yi, and A. D. Mazzeo (2017). A jellyfish-based aquatic locomotor with tunable gaits. In *Workshop on Material Robotics at 2017 Robotics Science and Systems*, Boston, MA.

NC1. **K. Yu** (2017). Motion control, planning and manipulation of nanowires under electric-fields in fluid suspension. In *Women in Robotics Workshop at 2017 Robotics Science and Systems*, Boston, MA.

- **Theses**

T2. **K. Yu** (2017). Motion control, planning and manipulation of nanowires under electric-fields in fluid suspension. Ph.D. dissertation, Department of Mechanical and Aerospace Engineering, Rutgers University.

T1. **K. Yu** (2010). Design and implementation of multi-robot vision simulation system. B.S. thesis, Department of Information Technical Science, Nankai University, China. (**Best Undergraduate Thesis Award.**)

RESEARCH GRANTS

G5. "CAREER: Simultaneous and Independent Control of Multiple Agents under a Common Electric Field", *National Science Foundation, CMMI-2146056*, 3/1/2022-2/28/2027, PI: **K. Yu**. Amount: $596,608.00.

G4. "Ray-F2R-FL: Ray-based Functional Regression with Federated Learning" ("Ray-based Distributed Computing in Multi-Task Functional Data Analysis for Neuromorphic Computing and Other Applications"), *SUNY-IBM AI Research Alliance, SUNY-IBM*, 10/15/2021-12/31/2023, PI: B. Si, co-PI: **K. Yu**, IBM Technical Leader: Carlos Costa. Amount: $200,000.00. Prorated amount: $40,000.00.

G3. "Hybrid Memristive Neural Network for Neuromorphic Computing with Automated Manipulation of Nanowires", *SUNY Research Seed Grant Program, SUNY*, 10/15/2020-12/31/2023, PI: **K. Yu**, co-PI: B. Si, N. Cady. Amount: $22,500.00.

G2. "Automated integration with micro/nanowire-based fine-pitch interconnects for 3D packaging", Integrated Electronics Engineering Center, Binghamton University, 8/1/2020-8/30/2021, PI: **K. Yu**. Amount: $40,000.00.

G1. "Universal Instruments/United Technologies Aerospace (UIC/UTAS) vibration project", Integrated Electronics Engineering Center, Binghamton University, 8/18/2020-9/3/2020, PI: **K. Yu**. Amount: $9,839.00.

PROFESSIONAL ACTIVITIES

- Member of the Institute of Electrical and Electronic Engineers (IEEE), 2013–present
- Member of the American Society of Mechanical Engineers (ASME), 2013–present
- Associate Vice President of the *IEEE Robotics and Automation Society (RAS) Media Services Board* (2019-present).
- Associate Editor
  - *IEEE Trans. on Automation Science and Engineering* (2022–present)
  - *IEEE Robotics and Automation Letters* (2021–present)
  - *IFAC Mechatronics* (2021–present)
  - *Frontiers in Robotics and AI* (2022–present)
  - *IEEE International Conference on Robotics and Automation (ICRA), Conference Editorial Board* (2020, 2021)
  - *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), Conference Editorial Board* (2019)

- – *IEEE/ASME International Conference on Advanced Intelligent Mechatronics (AIM), Conference Editorial Board* (2018, 2019, 2020)
  - – *American Control Conference (ACC), Conference Editorial Board* (2023)
  - – *Modeling, Estimation and Control Conference (MECC), Conference Editorial Board* (2022, 2023, 2024)
- Organizing/Operating Committee Member
  - – E-Media Co-Chair of the *2024 IEEE International Conference on Robotics and Automation (ICRA)*, Yokohama, Japan.
  - – Exhibit and Special Session Chair of the *2023 IEEE/ASME International Conference on Advanced Intelligent Mechatronics (AIM)*, Seattle, IL.
  - – Advisory committee member of the *2022 International Conference on Sustainability and Emerging Trends in Civil and Mechanical Engineering*, Virtual.
  - – Stop COVID-Spread Countermeasure (SC2) Committee of the *2022 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), Kyoto, Japan.*
- Program Committee Member
  - – *American Control Conference* (2023), San Diego, CA.
- Workshop Organizer
  - – Organizer and talk presenter of the workshop on "Progress Toward Automated Micro-Bio-Nano Factories Through Robotic Manipulation" at the *2019 IEEE International Conference on Robotics and Automation (ICRA)*, Montreal, Canada.
- Chair/co-Chair/Organizer of sessions in conferences
  - – "Micro and Nano Systems" (co-Chair) in *2023 IEEE/ASME International Conference on Advanced Intelligent Mechatronics*
  - – "Automation at Micro-Nano Scales 1" (co-Chair) in *2022 IEEE International Conference on Automation Science and Engineering*
  - – "Computer Vision in Automation 2" (Chair) in *2022 IEEE International Conference on Automation Science and Engineering*
- Reviewer for

  Journals: *IEEE Trans. on Robotics* (2016-2017), *IEEE/ASME Trans. on Mechatronics* (2015-2020, 2022-2023), *IEEE Trans. on Control Systems Technology* (2016-2017), *IEEE Robotics and Automation Letters* (2017, 2018-2020, 2022), *IFAC Mechatronics* (2022), *Control Engineering Practice* (2014-2016, 2018-2020), *ASME Journal of Dynamic Systems, Measurement and Control* (2014-2018), *IEEE Trans. on Automation Science and Engineering* (2013-2014, 2017-2023), *International Journal of Intelligent Robotics and Applications* (2016, 2019), *Micromachines* (2017, 2019-2021), *Robotica* (2018), *IEEE Access* (2018), *Automation in Construction* (2019-2022), *Robotics* (2019), *Robotics and Autonomous Systems* (2019), *Measurement and Control* (2019), *Precision Engineering* (2019), *Mechatronics* (2020, 2022, 2023), *Applied Sciences* (2020).

  Conferences: *American Control Conference (ACC)* (2014, 2017-2019), *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)* (2013, 2015, 2017-2018, 2020), *IEEE International Conference on Robotics and Automation (ICRA)* (2013, 2017-2019), *IFAC World Congress* (2020), *IEEE International Conference on Advanced Intelligent Mechatronics (AIM)* (2014-2015, 2019, 2023), *IEEE International Conference on Intelligent Transportation Systems (ITSC)* (2014, 2016), *IEEE International Conference on Automation Science and Engineering (CASE)* (2014, 2016-2020), *Modeling, Estimation and Control Conference (MECC)* (2022, 2023), *ASME Dynamic Systems and Control Conference (DSCC)* (2013, 2016-2017), *IEEE Vehicular Technology Conference (VTC)* (2016), *International Symposium on Applied Abstraction and Integrated Design (AAID)* (2017).

  Proposals: *US National Science Foundation (NSF)*: *National Robotics Initiative (NRI)* (2021).
- Panelist for

  Proposals: *US National Science Foundation (NSF)*: *CMMI* (2020), *ENG* (2019).

INVITED SEMINARS/TALKS

- *MITRE: Autonomous Systems & Robotics Session*, Binghamton University, Binghamton, NY, April 2023

- Keynote lecture at the *International Conference on Advances in Mechanical Engineering & Material Science*, VIT-AP University, Amaravati, Andhra Pradesh, India, April 2023
- *Rutgers University*, Department of Mechanical and Aerospace Engineering, Piscataway, NJ, April 2023
- *Newest Advances in Systems and Control from Recent DCSD CAREER Awardees* at Modeling, Estimation and Control Conference (MECC), Jersey City, NJ, October 2022
- *Peak at Watson Smart Health Research*, Binghamton, NY, July 2022
- *BU-VIT joint webinar series on autonomous systems*, Binghamton, NY, November 2021
- *IEEC packaging research consortium*, Binghamton, NY, October 2021
- *University at Buffalo*, Department of Mechanical and Aerospace Engineering, Buffalo, NY, December 2020
- *Rensselaer Polytechnic Institute (RPI)*, Department of Electrical Engineering, and Computer, and Systems Engineering, Troy, NY, May 2019
- *University of Waterloo*, Department of Mechanical and Mechatronics Engineering, Waterloo, ON, Canada, March 2017
- *Louisiana State University*, Department of Mechanical and Industrial Engineering, Baton Rouge, LA, March 2017
- *City College of New York*, Department of Mechanical Engineering, New York, NY, March 2017
- *Binghamton University*, Department of Mechanical Engineering, Vestal, NY, March 2017
- *McGill University*, Department of Mechanical Engineering, Montreal, QC, Canada, February 2017
- *California State University at Northridge*, Department of Mechanical Engineering, Northridge, CA, February 2017
- *Fort Lewis College*, Department of Physics and Engineering, Durango, CO, February 2017
- *Rowan University*, Department of Mechanical Engineering, Glassboro, NJ, January 2017
- *New Jersey Institute of Technology*, Department of Mechanical and Industrial Engineering, Newark, NJ, December 2016
- *Louisiana Tech University*, Department of Mechanical Engineering, Ruston, LA, December 2016
- *Boise State University*, Department of Mechanical and Biomedical Engineering, Boise, ID, November 2016

STUDENT SUPERVISION AND MENTORING [3]

- **Current graduate students**

  Xilin Li (Ph.D. student, *Mechanical Engineering, Binghamton University*, 2017 Fall-)
  Vishnu Veeraraghavan (Ph.D. student, *Mechanical Engineering, Binghamton University*, 2018 Fall-)
  Jiaxu Song (Ph.D. student, *Mechanical Engineering, Binghamton University*, 2019 Fall-)
  Shiming Fang (Ph.D. student, *Mechanical Engineering, Binghamton University*, 2019 Fall-)

- **Graduate students alumni/alumna**

  - Juan Wu*, Ph.D.,
    Thesis: Motion Control of Multiple Micro-and Nano-Particles in Fluid Suspension with a Coupled External Electric Field, Mechanical Engineering, Binghamton University, December 2022.
    Award: *Academic Excellence in Mechanical Engineering Research Award*
    First job after graduation: Solution Engineer, Siemens Healthineers, NY

  - Kyle Olstein (4+1 master student, *Mechanical Engineering, Binghamton University*, 2020 Summer-2021 Spring)

  - Arron Danehy (4+1 master student, *Mechanical Engineering, Binghamton University*, 2020 Summer)

- **Senior design faculty advisor**

  Binghamton University

  – "Micro Aquarium" (Q. O'Brien, S. Pappalardo*, J. Pareti, S. Savidge), *2023/2024*

  – "Autonomous RC Race Car with Artificial Intelligence" (L. Roels, A. Ryan*, V. Obando, B. Shiya, C. Grillo), *2023/2024*, co-advise with Prof. J. Zhao.

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[3]Underlined students with a "*" symbol are female students under my supervision.

- "Design and Prototype of Robotic Manipulator" (M. Madsen, B. Thompson*, C. R. Anderson*, A. Ricci, G. Nowell), *2022/2023*
- "Robotic Arm Manipulator" (B. Iven, J. Jandik, K. Roach, E. Erb*), *2021/2022*
- "RACECAR Upgrade for Autonomous Driving with Aggressive Maneuvers" (W. Linderman, C. Dai, T. Gao), *2020/2021*
- "Electrospinning Drum Collector" (M. Lindley, H. Yu), *2020/2021*, co-advise with Prof. P. Zhang.
- "RACECAR Upgrade for Autonomous Driving with Aggressive Maneuvers" (J. Xing, M. Islam, Y. Tian), *2019/2020*
- "Reconnaissance Robot" (C. Gale, A. Paul, D. Adamczuk, J. McCoy, J. Squitieri), *2018/2019*, co-advise with Prof. R. McGrann. (**First Place winner of the 2019 MacDonald Family Prize in Senior Design**)
- "Crack-Filling Robot" (M. Jackson*, D. Rozhkov, L. S. Bishop*, J. Brown, M. Wally, A. K. Reddy), *2018/2019*
- "RACECAR System Upgrade" (J. C. Escober, J. Long, R. Grunder, W. Luo), *2018/2019*
- "CubeSat Deorbiting Mechanism" (J. Chinkel, E. Comas*, S. D'Attore, C. Long*, N. Swerbilov, A. Virga), *2018/2019*

- **Undergraduate research assistant/intern mentoring**

  Undergraduate student engaging: A. Prabhu* (2024, Biomedical Engineering), J. Lim (2024, Mechanical Engineering), J. Harrison(2023-2024, Mechanical Engineering), T. Zierer (2023-2024, Mechanical Engineering), J. Pforte (2023-2024, Mechanical Engineering), J. Kuster* (2023-2024, Biomedical Engineering), N. Viju* (2023-2024, Biomedical Engineering), N. M. Fonseca* (2023-2024, Mechanical Engineering), C. Anderson* (2020-2021, Mechanical Engineering/Electrical and Computer Engineering), T. Gao (2020, Mechanical Engineering), J. Xing (2020, Mechanical Engineering), Y. Tian (2019-2020, Mechanical Engineering), L. Yang (2019, Electrical and Computer Engineering)

  Summer Training Experience in Engineering Research (STEER): B. Sevalia (Summer 2019, Physics/ Mechanical Engineer, Xavier University of Louisiana)

  Scalable Asymmetric Lifecycle Engagement Microelectronics Workforce Development Program (SCALE): H. Li (Spring 2024, Computer Science)

  Binghamton University Projects for New Undergraduate Researchers (BUPNUR): J. Bonfiglio (Spring 2024, Computer Engineering, Mathematical Sciences) and D. Ramirez (Spring 2024, Mathematical Sciences)

- **Independent study and ME project mentoring**

  - "Nanomanipulation Using External Electric Fields", S. Pappalardo* (Spring 2024)
  - "Modeling and Control of an Autonomous Driving Car in a Car Simulation Environment", B. Thompson* (Spring 2023)
  - "Simultaneous Localization and Mapping of Autonomous Vehicle", D. Demetros (Spring 2021)
  - "Autonomous Surface Crack Detection and Filling Robot", M. Castellanos (Spring 2021)
  - "3D Manipulation of Micro/Nano Particles in Fluid Suspension", J. Song (Spring 2021)
  - "Task and Motion Planning for Agile Autonomous Vehicles", S. Fang (Spring 2021)
  - "Close-Loop Control of a 3D Printer", A. R. Waghole (Fall 2019)

- **Dissertation committee**

Ph.D. students:		
M. Daeichin, *Mechanical Engineering*		Advisor: Dr. S. Towfighian
J. Walsh, *Mechanical Engineering*		Advisor: Dr. R. Miles
M. Pallay, *Mechanical Engineering*		Advisor: Dr. S. Towfighian
V. Kudalka, *Computer Science*		Advisor: Dr. S. Zhang
C. Cai, *Mechanical Engineering*		Advisor: Dr. S. B. Park
S. M. Mousavi, *Mechanical Engineering*		Advisor: Dr. S. Towfighian
J. H. Ha, *Mechanical Engineering*		Advisor: Dr. S. B. Park
Y. Lai, *Mechanical Engineering*		Advisor: Dr. S. B. Park
J. Pourghader, *Mechanical Engineering*		Advisor: Dr. R. Miles
M. Karimi, *Mechanical Engineering*		Advisor: Dr. R. Miles
Sivaranjani A, *Electrical and Electronics Engineering, Anna University*		Advisor: Dr. B. Vinod

M.S. students:	D. Nelson, *Mechanical Engineering*	Advisor: Dr. S. Towfighian
	P. Yin, *Mechanical Engineering*	Advisor: Dr. S. B. Park
	J. H. Ha, *Mechanical Engineering*	Advisor: Dr. S. B. Park
	F. Xue, *Biomedical Engineering*	Advisor: Dr. Y. Wan
	Y. Lai, *Mechanical Engineering*	Advisor: Dr. S. B. Park
	Y. Tian, *Mechanical Engineering*	Advisor: Dr. S. Towfighian
	K. Hunte, *Mechanical and Aerospace Engineering, Rutgers University*	Advisor: Dr. J. Yi
	M. A. Razzaq, *Mechanical Engineering*	Advisor: Dr. M. Younis
	H. Albatayneh, *Mechanical Engineering*	Advisor: Dr. M. Younis

UNIVERSITY/DEPARTMENTAL SERVICES

- *Thomas J. Watson School of Engineering and Applied Science, Binghamton University*

  - Watson Commencement Committee (2023, 2024)
  - Instructional Software & Labs Committee (2018-2020)
    - Conducted a comprehensive assessment of projected needs for the teaching laboratories in the Mechanical Engineering department for the period 2019-2024.
    - Compiled and analyzed data on equipment and space requirements, ensuring alignment with the department's instructional objectives.
    - Evaluated and summarized the current inventories and status of all eight teaching laboratories across the department.
    - Provided recommendations and justifications for necessary upgrades or additions to the teaching laboratories, considering emerging technologies and pedagogical advancements.

- *Department of Mechanical Engineering, Binghamton University*

  - Faculty Search Committee (2021-2023)
  - Graduate Studies Committee (2020-2021, 2022-2024)
  - Undergraduate Studies Committee (2018-2020)
  - Seminar Committee (2018-2019, 2023-2024)
  - Junior/Sophomore Advising (2018-present)

OUTREACH

- Guest Lecture for the *EDD 112 Intro to Engineering Analysis*, Engineering Design Division, Binghamton University (April 15, 2024)
- Panelist for Women in STEM, the Society of Hispanic Professional Engineers (SHPE) (March 25, 2024)
- Faculty Advisor for the Binghamton University Projects for New Undergraduate Researchers (BUPNUR) (Spring 2024)
- "Nanofish Frenzy: Dive into the Exciting World of Nanomanipulation". High School Track, Community Day, National Engineers Week (February 24, 2024)
- Faculty Advisor for the Scalable Asymmetric Lifecycle Engagement Microelectronics Workforce Development Program (SCALE) (Spring 2024)
- "Autonomous Racing Cars and the Thrill of Safe Drifting", Mini Lectures to High School Seniors (Oct 28, 2023)
- Guest Lecture for the *ISE 479 Industrial Automation & Control*, Department of Systems Science and Industrial Engineering, Binghamton University (October 17, 2023)
- Panelist for "Careers in Academia", Modeling, Estimation and Control Conference (October 5, 2022)
- Judge for BattleBots Competition, Watson Combat Robotics League (Spring 2022, Fall 2022, Spring 2023)
- Lecturer for Introduction to Autonomous Intelligent Robots, Lyceum Program (Winter 2021)
- Lab tours with Broome County Promise Zone Camp (August 8, 2019)
- Faculty Advisor for the Summer Training Experience in Engineering Research (STEER) (Summer 2019)
- Faculty Advisor for the Strategic Partnership for Industrial Resurgence (SPIR) Project (Spring 2019)

- Instructor at the First Annual Junior Robotics Challenge for K-6 students (March 30, 2019)
- Panelist for Women in STEM, National Engineers Week (February 18, 2019)