Kaiyan Qiu, *Ph.D.* | *Curriculum Vitae*

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School of Mechanical and Materials Engineering, Washington State University, Pullman, WA 99164

ACADEMIC APPOINTMENTS & EDUCATIONS

Washington State University, Pullman, WA (08/2020-Present)
- **Berry Family Assistant Professor** in School of Mechanical and Materials Engineering.

Princeton University, Princeton, NJ (09/2014-06/2015)
& University of Minnesota, Minneapolis, MN (07/2015-06/2020)
- **Postdoctoral Associate** in Mechanical Engineering. Postdoc Advisor: Michael C. McAlpine

Dartmouth College, Hanover, NH (06/2013-08/2014)
- **Research Associate** in Thayer School of Engineering. Postdoc Advisor: Ulrike U. G. Wegst

Cornell University, Ithaca, NY (08/2007-06/2013)
- **Ph.D.** (August 2012) in Fiber Science with Polymers & Biological Engineering. PhD Advisor: Anil N. Netravali

Donghua University, Shanghai, China (09/2000-03/2007)
- **B.S. & M.S.** in Chemical Engineering

RESEARCH INTERESTS

- 3D Printing and Bioprinting
- Functional Materials
- Bionic Systems for Haptics and Rehabilitations
- Wearable Biosensors for Health Monitoring
- Artificial Organs and Organoids for Surgical and Medical Applications
- Biomimetic Surfaces for Enhanced Locomotion

PAPER PUBLICATIONS (CITATION 2648 & H-INDEX 19 & I10 INDEX 22)

Names with underline are the students advised by Kaiyan Qiu

[30] Hongyi Shen, Nikolai Bogdv, Yusen Zhang, Shanshan Yao, Prashanta Dutta, **Kaiyan Qiu***. 'A Customizable, Geometry-Aware Manufacturing Framework for Modular, Multimodal Prosthetic Sensing System.' 2026, ***Cell Reports Physical Science***, Under Review (**3** students advised by Qiu, **IF: 7.3**)

[29] Yonghao Fu, Chuchu Chen, Xinyi Li, Yang Song, Christopher D. Simpson, Luke P. Naeher, **Kaiyan Qiu***, D. Du. 'Fabrication and Optimization of a Hybrid 3D-Printed Flexible Electrochemical Biosensor for Sensitive Detection of 1-Hydroxypyrene Glucuronide, an Associated Wildfire Exposure Biomarker' ***Talanta***, 2026, Accepted (**2** students advised by Qiu, **IF: 6.1**)

[28] Alejandro G. Obando, Hongyi Shen, Myles McGoven, Yusen Zhang, Vivien Lin, Darry Fu, Ryan Baumwart, **Kaiyan Qiu***. '3D-Printed Dynamic Heart Model with Left-Side Anatomy and Integrated Sensor for Edge-to-Edge Repair and Regurgitation Reduction.' ***Advanced Materials Technologies***, 2026, e70885 (**6** students advised by Qiu, **IF: 6.2**)

- ❖ Featured in WSU Insider & 6 news outlets and 3 blogs (Altmetric: 59)
- ❖ Live Interviewed and Featured in Fox 13 TV News

[27] Chuchu Chen[+], Yonghao Fu[+], Yun Liu, Yuehe Lin, Dan Du, **Kaiyan Qiu***. '3D-printed hollow microneedle-based electrochemical sensor for real-time and wireless glucose monitoring.' ***Analyst***, 2026 (accepted in 2025), 151, 1182-1194 (**2** students advised by Qiu, **IF: 3.3**)

- ❖ Featured in WSU Insider & 6 news outlets and 1 blog (Altmetric: 49)

[26] Chuchu Chen[+], Yonghao Fu[+], Yun Liu, Pranshanta Dutta, Yuehe Lin, Dan Du, **Kaiyan Qiu***. 'Next-Generation Health Monitoring: The Role of Nanomaterials in 3D-Printed Wearable Devices.' ***Materials Today*****,** 2025, 86, 317-339 (**2** students advised by Qiu, **IF: 22.1**)

[25] Chuchu Chen, **Kaiyan Qiu***. '3D printed artificial organ models for surgical applications.' Biomedical Nanotechnology: Methods in Molecular Biology, vol 2902, ***Springer Nature***, 2025, pp 183-195, (**1** student advised by Qiu)

[24] Eric S. Chen[+], Alaleh Ahmadian[+], Sonja S. Sparks, Chuchu Chen, Aryan. Deshwal, Janardhan R. Doppa, **Kaiyan Qiu***. 'Machine learning enabled design and optimization for 3D-printing of high-fidelity presurgical organ models.' ***Advanced Materials Technologies***, 2025, 10(1), 202400037. (**3** students advised by Qiu, **IF: 6.2**)

- ❖ Featured in WSU Insider & 17 news outlets and 1 blog (Altmetric: 134)
- ❖ Reported and Featured in Nvidia Blog News

[23] Sonja S. Sparks[+], Alejandro G. Obando[+], Yizhong Li, Si Chen, Shanshan Yao, **Kaiyan Qiu***. '3D-printed biomimetic and bioinspired soft actuators.' ***IET Cyber-Systems and Robotics***, 2024, 6(4), e70001. (**2** students advised by Qiu, **IF: 1.2**)

[22] Chuchu Chen, Yonghao Fu, Sonja S. Sparks**,** Zhaoyuan Lyu, Arijit Pradhan, Shichao Ding, Narasimha Boddeti, Yun Liu, Yuehe Lin, Ddan Du, **Kaiyan Qiu***. '3D-printed flexible microfluidic health monitor for *in-situ* sweat analysis and biomarker detection.' ***ACS Sensors***, 2024, 9, 3212-3223. (**3** students advised by Qiu, **IF: 9.1**)

- ❖ Featured in WSU Insider & 25 news outlets and 2 blogs (Altmetric: 211)
- ❖ Top 10 most read paper in *ACS Sensors* in July 2024
- ❖ Selected by Editor-In-Chief as One of Favorite Papers in the First 10 Years of ACS Sensors

[21] Yu Sun, Jesse Heacock, Chuchu Chen, **Kaiyan Qiu**, Liming Zou, Jianguo Liu, Yan V. Li. 'Incorporation of gentamicin- encapsulated PLGA nanoparticles into PU/PEO nanofiber scaffolds for biomedical applications.' ***ACS Applied Nano Materials***, 2023, 6(17), 16096-16105 (**1** student advised by Qiu, **IF: 5.5**)

[20] Zhaoyuan Lyu, Shichao Ding, Dan Du, **Kaiyan Qiu**, Jin Liu, Xiao Zhang, Yuehe Lin. 'Recent advances in biomedical applications of 2D nanomaterials with peroxidase-like properties.' ***Advanced Drug Delivery Review***, 2022, 185, 114269 (**IF: 17.6**)

[19] **Kaiyan Qiu**, Ulrike G. K. Wegst. 'Excellent mechanical and electrical properties of anisotropic freeze-cast native and carbonized bacterial cellulose-alginate foams.' ***Advanced Functional Materials***, 2022, 32(1), 2105635 (WSU affiliation, research article, **IF: 19.0**)

- ❖ Featured in WSU Insider & High Impact Factor

[18] Ghazaleh Haghiashtiani[+](Co-First), **Kaiyan Qiu[+](Co-First)**, Jorge D. Zhingre Sanchez, Zachary J. Fuenning, Priya Nair, Sarah E. Ahlberg, Paul A. Iaizzo, Michael C. McAlpine. '3D printed patient-specific aortic root models with internal sensors for minimally invasive applications.' ***Science Advances***, 2020, 6(35), eabb4641 (Published when in WSU, **IF: 12.5**)

- ❖ Featured in WSU Insider, Medical News, MedicalXpress, Science Daily, and numerous other news outlets

[17] Molly E. Kupfer[+], Wei-Han Lin[+], Vasanth Ravikumar, **Kaiyan Qiu**, Lu Wang, Ling Gao, Didarul B. Bhuiyan, Megan Lenz, Jeffrey Ai, Ryan R. Mahutga, DeWayne Townsend, Jianyi Zhang, Michael C. McAlpine, Elena. G. Tolkacheva, Brenda M. Ogle. '*In situ* expansion, differentiation and electromechanical coupling of human cardiac muscle in a 3D bioprinted, chambered organoid.' ***Circulation Research***, 2020, 127(2), 207-224 (**IF: 16.2)**

- ❖ Selected as the Cover and the Best Manuscript Award in ***Circ. Res.***

[16] Sung Hyun Park[+], Ruitao Su[+], Jaewoo Jeong, Shuang-Zhuang Guo, **Kaiyan Qiu**, Daeha Joung, Fanben Meng, Michael C. McAlpine. '3D printed polymer photodetectors.' ***Advanced Materials***, 2018, 30(40), 1803980 (**IF: 26.8)**

- ❖ Featured in Nature News, Newsweek, National Geographic, and numerous other news outlets

[15] **Kaiyan Qiu**, Zhichen Zhao, Ghazaleh Haghiashtiani, Shuang-Zhuang Guo, Mingyu He, Ruitao Su, Zhijie Zhu, Didarul B. Bhuiyan, Paari Murugan, Fanben Meng, Sung Hyun Park, Chih-Chang Chu, Brenda M. Ogle, Daniel A. Saltzman, Badrinath R. Konety, Robert M. Sweet, Michael C. McAlpine. '3D printed organ models with physical properties of tissue and integrated sensors.' ***Advanced Materials Technologies***, 2018, 3(3), 1700235 (**IF: 6.2)**

- ❖ Selected as a Best of 2018 article and the Inside Cover in ***Adv. Mater. Technol.***
- ❖ Featured in NIH News, Science Daily, Materials Today, Fox News, and numerous other news outlets

[14] **Kaiyan Qiu**, Ghazaleh Haghiashtiani, Michael C. McAlpine. '3D printed organ models for surgical applications.' ***Annual Review of Analytical Chemistry***, 2018, 11, 287-306 (**IF: 7.5)**

- ❖ Featured in Annual Reviews News, Knowable Magazine, and a few other news outlets

[13] Shuang-Zhuang Guo, **Kaiyan Qiu**, Fanben Meng, Sung Hyun Park, Michale C. McAlpine. '3D printed stretchable tactile sensors.' ***Advanced Materials***, 2017, 29(27), 1701218 (**IF: 26.8)**

- ❖ Featured in NIH News, Advanced Science News, Materials Today, and numerous other news outlets

[12] **Kaiyan Qiu**, Anil N. Netravali. 'In situ produced bacterial cellulose nanofiber-based hybrids for nanocomposites.' ***Fibers***, 2017, 5(3), 31 (**IF 3.9**)

- ❖ Selected as Cover in ***Fibers*** 5(3)

[11] **Kaiyan Qiu**, Anil N. Netravali. 'Polyvinyl alcohol based biodegradable polymer nanocomposites.' Chapter 13 In: Biodegradable Polymers, Vol. 1: Advancement in Biodegradation Study and Applications, ***Nova Science Publishers, Inc.***, New York, 2015, pp. 325-379

[10] **Kaiyan Qiu**, Anil N. Netravali. 'A review of fabrication and applications of bacterial cellulose based nanocomposites.' ***Polymer Reviews***, 2014, 54(4), 598-626 (**IF: 11.9)**

[9] **Kaiyan Qiu**, Anil N. Netravali. ""Green" composites based on bacterial cellulose produced using novel low cost carbon source and soy protein resin.' Chapter 11 In: Recent Advances in Adhesion Science and Technology in Honor of Dr. Kash Mittal, ***CRC Press***, Boca Raton, FL, 2014, pp. 193-208

[8] **Kaiyan Qiu,** Anil N. Netravali. 'A composting study of membrane-like polyvinyl alcohol based resins and nanocomposites.' ***Journal of Polymers and the Environment***, 2013, 21(3), 658-674 (**IF: 5.0)**

[7] **Kaiyan Qiu,** Anil N. Netravali. 'Halloysite nanotubes reinforced biodegradable nanocomposites using noncrosslinked and malonic acid crosslinked polyvinyl alcohol.' ***Polymer Composites***, 2013, 34(5), 799-809 (**IF: 4.7)**

[6] **Kaiyan Qiu**, Anil N. Netravali. 'Fabrication and characterization of biodegradable composites based on microfibrillated cellulose and polyvinyl alcohol.' ***Composites Science and Technology***, 2012, 72(13), 1588-1594 (**IF: 9.8)**

[5] **Kaiyan Qiu**, Anil N. Netravali. 'Bacterial cellulose-based membrane-like biodegradable composites using cross-linked and noncross-linked polyvinyl alcohol.' ***Journal of Materials Science***, 2012, 47(16), 6066-6075 (**IF: 3.9)**

[4] Feng Hong, **Kaiyan Qiu**. 'An alternative carbon source from konjac powder for enhancing production of bacterial cellulose in static cultures by a model strain *Acetobacter aceti subsp. xylinus* ATCC 23770.' ***Carbohydrate Polymers***, 2008, 72(3), 545-549 (**IF: 12.5)**

[3] **Kaiyan Qiu**, Feng Hong. 'Mutation of *Acetobacter xylinum* for high-yield production of bacterial cellulose.' ***Journal of Donghua University***, 2008, 34(2), 181-185

[2] Feng Hong, **Kaiyan Qiu**, Y. Tan, Q. Chen. 'Production and characterization of bacterial cellulose membranes in static cultivations.' ***Proceedings of the 2007 International Conference on Advanced Fiber and Polymer Materials***, Shanghai, China, Oct. 15-17, 2007, Vol. 2: 709-711

[1] **Kaiyan Qiu**, Feng Hong. 'Development of an alternate carbon source from konjac powder for high-yield production of bacterial cellulose.' ***Proceedings of 2007 International Forum on Biomedical Textile Materials***, Shanghai, China, May 30 -June 2, 2007, pp 235-240

PATENTS, INVESTION DISCLOSURES AND PROVISIONAL PATENTS

[8] **Kaiyan Qiu** (Washington State University) "3D-Printed Dynamic Heart Model with Left-Side Anatomy and Integrated Sensor for Edge-to-Edge Repair and Regurgitation Reduction". ID: Disclosure-26-00061, 2026 (A provisional patent was filed in February 2026)

[7] **Kaiyan Qiu**, Dan Du. (Washington State University) '3D-printed hollow microneedle-based electrochemical sensor for real-time and wireless glucose monitoring.' ID: Disclosure-26-00001, 2025 (A provisional patent was filed in 2025)

[6] **Kaiyan Qiu**, Janardhan R. Doppa (Washington State University) 'Machine Learning Enabled Design and Optimization for 3D-Printing of High-Fidelity Presurgical Organ Models.' ID: Discloursure-24-00063 (A provisional patent was filed in 2024)

[5] **Kaiyan Qiu**, Dan Du. (Washington State University) '3D-printed wearable flexible biosensors with microfluidic channels and single-atom catalyst.' ID: Disclosure-23-00003, 2022 (A provisional patent was filed in 2024)

[4] Michale C. McAlpine, **Kaiyan Qiu**, Ghazaleh Haghiashtiani, Robert M. Sweet (University of Minnesota). '3D printed organ model with integrated electronic device.' ***US 11741854 B2***, 2023

[3] Anil N. Netravali, **Kaiyan Qiu** (Cornell University). 'Bacterial cellulose based 'green' composites.' *US 9499686 B2*, 2016

[2] Ulrike G. K. Wegst, David Herron, Marco Kretschmar, Samuel Bauer, **Kaiyan Qiu** (Dartmouth College). 'Material and method of manufacture of electrodes and porous filters formed of ice-templated graphene-oxide and carbon nanotube composite, and applications thereof.' *WO 2015109272 A1*, 2015

[1] Feng Hong, **Kaiyan Qiu** (Donghua University). 'Preparation of a carbon source from konjac flour for producing bacterial cellulose.' *CN 100595271 C*, 2010

PENDING PROPOSALS & FUNDED GRANTS & DECLINED PROPOSALS

Pending Proposals

[42] NSF DARE (PI: **Kaiyan Qiu**, Co-PIs: Zhong Wang, Prashanta Dutta) *Preparation for Submission in Apr. 2026*

- Intelligent Haptics for Prosthetic Learning and Control for Lower-Limb Amputees
- Requested **~$600,000**

[41] NIH NIBIB STTR (**PI: Kaiyan Qiu**, with DL ADV-Tech, LLC) *Preparation for Submission in Apr. 2026*

- Monitoring of Cytokines Associated Biomarkers Using Single-Atom Catalyst-Enhanced 3D-Printed Electrochemical Biosensors.
- Requested ~**$300,000** (My part is ~$180,000)

[40] NIH NIBIB R21 Trailblazer (**PI: Kaiyan Qiu**, Co-I: Narasimha Boddeti) *Submitted in Feb. 2026, Pending*

- Enhancing Contractility in Cardiac Tissue via Anisotropic Liquid Crystal Elastomer Substrates
- Requested **$585,276** (My Part is about $381,217)

[39] NIH NIBIB R21 Trailblazer (**PI: Kaiyan Qiu**, Co-I: Narasimha Boddeti) *Submitted in Oct. 2025, Pending*

- 3D-Printed Dynamic Heart Phantom Using Liquid Crystal Elastomers with Dynamic Covalent Bonds.
- Requested **$558,552** (My Part is $306,704)

[38] NIH NIBIB SBIR (**WSU PI: Kaiyan Qiu,** with DL ADV-Tech, LLC). *Submitted in Sept. 2025, Pending*

- Monitoring of Alzheimer's Disease Associated Biomarkers Using Single-Atom Catalyst-Enhanced 3D-Printed Electrochemical Biosensors.
- Requested **$305,779** (My part is $90,000)

Awarded and Participated Grants at WSU

[37] WSU Commercialization Special Project Fund (**PI Kaiyan QIu**) *Funded in Dec. 2024*

- 3D-printed wearable biosensors and electronics.
- Awarded **$25K**

[36] NSF-GRFP (Applicant Sonja Sparks, **Advisor Kaiyan Qiu**) *Funded in May 2024*

- 3D-printed biomimetic sharkskin for drug reduction
- Awarded **$111K** (for 3 Yrs)
- My PhD student **Sonja Sparks is the only recipient in WSU in 2024**

[35] NSF NRT-LEAD (PI: Prashanta Dutta, **Core Participant/Thrust Co-Lead: Kaiyan Qiu)** *Funded in Aug. 2023*

- Convergent next-generation robotics training: leadership, entrepreneurship, and adaptive design (NRT- LEAD) amid a Changing World of Work
- **Three** my PhD students received and will receive one-year RA support as an NRT-trainee
- Awarded (**$34K for 1 Yr for each student**)

[34] WSU Commercialization Special Fund (**PI Kaiyan Qiu**) *Funded in Nov. 2022*

- 3D-printed wearable biosensors.
- Awarded **$15K**

[33] WSU New Faculty Seed Grant 2022 (**PI Kaiyan Qiu**) *Funded in May 2022*

- 3D-Printed biomimetic sharkskin for underwater applications & Featured in WSU Insider
- Awarded **$25K**

[32] WSU Industrial Engagement (**PI Kaiyan Qiu**) *Funded in May 2022*

- 3D-printed wearable flexible biosensors
- Awarded **$3K**

[31] Working with Industry 101 (**PI Kaiyan Qiu**) *Funded in May 2022*

- Awarded **$3K**

[30] NIH NIAID R21AI69225 (PI: Wen-ji Dong; **CO-I: Kaiyan Qiu**; CO-I: Cornelius Ivory) *Funded in Feb. 2022*

- Paper-based nucleic acid amplification test for rapid diagnosis of hepatitis C viral (HCV) infection
- Awarded **$406,490 (**My part is **$22K**)

[29] Cougar Cage (**PI Kaiyan Qiu**) *Funded in July 2021*
- 3D-printed cardiac models & Featured in WSU Insider
- Awarded **$50K**

[28] JCATI (PI: Wen-ji Dong; **CO-PI: Kaiyan Qiu**; Industry Partner: Altek) *Funded in Fall 2020*
- Mask-based sensor for real time monitoring SARS-CoV-2 infection
- Award **$58,086 (**The grant is managed by PI**)**

Submtited and Declined Grants at WSU

[27] President's Big Ideal Proposal (PI: Jana Doppa; **Key Member: Kaiyan Qiu**) *Submitted in Feb. 2026*
- AIDTech: AI-Driven Technology Development for Societal Good
- Requested ~**$300,000**

[26] President's Big Ideal Proposal (PI: Zhong Wang; **Co-PI: Kaiyan Qiu**) *Submitted in Jan. 2026*
- Center for Human-Machine Integration: Advancing Adaptive Intelligence and Human Learning
- Requested ~**$270,000**

[25] WSU Commercialization GAP Fund 2025 (**PI,** requested **$50K**) *Submitted in Sept. 2025*
- 3D-printed wearable biosensors
- Requested **$50K**

[24] NSF CCSS Career **(PI Kaiyan Qiu**) *Submitted in Jul 2025*
- CAREER: Bionic Skin System for Restoration of Multimodal Haptic Sensation in Amputees
- Requested **$662,936**

[23] DOD Preproposal **(PI Kaiyan Qiu**; Co-PI Annie Du, Co-Is Yuehe Lin, Jason Aldred) *Submitted in Jun. 2025*
- Monitoring of Alzheimer Associated Biomarkers for Veterans Using Single-Atom Catalyst-Enhanced 3D-Printed Electrochemical Biosensors
- Requested **$1.1M**

[22] NIH NIBIB SBIR (**WSU PI: Kaiyan Qiu,** with DL ADV-Tech, LLC). *Submitted in Apr. 2025*
- Single-Atom Catalyst-Enhanced Wearable Colorimetric Biosensor for Real-Time Monitoring of Chronic Kidney Disease
- Request **$305,779**

[21] NIH NIBIB R21 Trailblazer (**PI Kaiyan Qiu**, Co-I Narasimha Boddeti) *Submitted in Feb. 2025*
- 3D-Printed Dynamic Heart Phantom Using Liquid Crystal Elastomers with Dynamic Covalent Bonds
- Requested **$388,995**

[20] NIH NIKKD R01 (**PI Kaiyan Qiu**, Co-Is Annie Du, Yuehe Li, Olivia Coiado**)** *Submitted in Feb. 2025*
- 3D-Printed Wearable Electrochemical Biosensor for Monitoring Chronic Kidney Disease
- Requested **$1,811,494**

[19] NIH NIBIB R01 (**PI Kaiyan Qiu,** Co-Is Prashanta Dutta, Shanshan Yao) *Submitted in Oct. 2024*
- Restoration of Multimodal Haptic Sensations for Amputees through Customized Bionic Skin
- Requested **$1,860,506**

[18] WSU Commercialization GAP Fund 2024 (**PI Kaiyan Qiu**, Co-PI Jana Doppa) *Submitted in Sep. 2024*
- AI-assisted 3D-printing of Organ Models
- Requested **$50K**

[17] WSU Commercialization GAP Fund 2024 (**PI Kaiyan Qiu**, Co-PI Annnie Du) *Submitted in Sep. 2024*
- 3D-printed wearable biosensors
- Requested **$50K**

[16] NSF Career (**PI Kaiyan Qiu**) *Submitted in Jul. 2024*
- CAREER: Interfacing Smart Bionic Skin System on Prosthetics with Amputee Stump: Restoration of Multimodal Haptic Sensation through an Electronics-Stimulated Approach
- Requested **$669,586**

[15] Washington Research Foundation (PI: Narasimha Boddeti, **Co-PI**: Kaiyan Qiu) *Submitted in Mar. 2024*

- ❖ Center for Additive Manufacturing in Translational Biomedical Engineering
- ❖ Requested **$199,723**

[14] NSF CCSS (**PI Kaiyan Qiu**, Co-PI Yuehe Lin) *Submitted in Dec. 2023*
- ❖ 3D-Printed Wearable Biosensors for Non-Invasive Sweat Analysis and Health Monitoring
- ❖ Requested **$464,902**

[13] NIH NIBIB R21 (**PI Kaiyan Qiu**, Co-PI Yuehe Lin) *Submitted in Oct. 2023*
- ❖ 3D-Printed Wearable Glucose Biosensors Based on Microneedles and Single-Atom Catalysts
- ❖ Requested **$405,509**

[12] DOD DARPA (**WSU PI Kaiyan Qiu**, Co-PI Konstantin Matveev, Industry Partner Philips) *Submitted in Oct. 2023*
- ❖ Bottom-up Design of Optimal Drag-reducing Architected Surfaces
- ❖ Requested **$316,344**

[11] NSF CAREER (**PI Kaiyan Qiu**) *Submitted in Jul. 2023*
- ❖ CAREER: Smart Bionic Skin System for Prosthetics: Restoration of Multimodal Haptic Sensations through an Electronics-Stimulated Approach
- ❖ Requested **$525,882**

[10] NIH NIBIB R21 Trailblazer (**PI Kaiyan Qiu,** CO-I Ryan Bawmwart) *Submitted in Jun. 2023*
- ❖ 3D-Printed Patient-Specific Cardiac Models with Integrated Pulsating, Circulatory, and Pressure Sensing Functions for Transcatheter Edge-to- Edge Repair Rehearsal
- ❖ Requested **$566,490**

[9] NIH NIBIB R21 (**PI Kaiyan Qiu**, Consultant Chris Anderson) *Submitted in Oct 2022*
- ❖ 3D-Printed Patient-Specific Cardiac System Models with Integrated Pulsating and Pressure Sensing Functions for Advanced Surgical Applications
- ❖ Requested **$391,009**

[8] NSF ECCS CCSS (**PI Kaiyan Qiu**, Co-PI Yuehe Lin) *Submitted in Nov. 2022*
- ❖ 3D-Printed Wearable Flexible Biosensors Based on Microfluidic Channels and Single-Atom Catalysts
- ❖ Requested **$551,995**

[7] NSF-GRFP (Applicant Sonja Sparks, **Advisor Kaiyan Qiu**) *Submitted in Oct. 2022*
- ❖ 3D-printed biomimetic sharkskin for drug reduction
- ❖ Requested ~**$111K**

[6] WSU Commercialization GAP Fund 2022 (**PI Kaiyan Qiu,** CO-PI: Annie Du) *Submitted Sept. 2022*
- ❖ 3D-printed wearable biosensors
- ❖ Requested **$40K**

[5] RA+10K 2022 (**PI Kaiyan Qiu**, Co-PI Annie Du) *Submitted Sept. 2022*
- ❖ 3D-printed wearable biosensors with microfluidic channels and single atom catalysts
- ❖ Requested **RA for one semester +$10K**

[4] Cougar Cage Spring 2022 (**PI Kaiyan Qiu**) *Submitted Spring 2022*
- ❖ 3D-printed wearable flexible biosensors with single-atom catalysts
- ❖ **1 of 6 Finalists** presented to donors in Seattle WA
- ❖ Requested **$50K**

[3] Cougar Cage Fall 2021 (**PI Kaiyan Qiu**) *Submitted Fall 2021*
- ❖ 3D-printed biomimetic sharkskin for underwater applications
- ❖ Requested **$50K**

[2] RA+10K 2021 (**PI Kaiyan Qiu**, Co-PI Narasimha Boddeti) *Submitted Sept. 2021*
- ❖ 3D-printed patient-specific presurgical organ models with medical imaging-retrieved anisotropic and nonlinear mechanical properties
- ❖ Requested **RA for one semester +$10K**

[1] WSU New Faculty Seed Grant 2021 (**PI Kaiyan Qiu**) *Submitted Feb. 2021*
- ❖ 3D Printed Artificial Organs: From Sensing Electronics to Bionic Application
- ❖ Requested **$25K**

ORGANIZED/INVITED TALKS, GUEST LECTURES & CONFERENCES

[44] **Kaiyan Qiu**. Two oral talks "3D-Printed Dynamic Heart Model with Left-Side Anatomy and Integrated Sensor for Edge-to-Edge Repair and Regurgitation Reduction" & "3D-printed flexible microfluidic health monitor for in-situ sweat analysis and biomarker detection". In IMECE 2026, Vancouver, BC, Canada, November 2026 (Served as an organizer for a mini symposium for Fluid Mechanics and Translation in Medical Devices)

[43] **Kaiyan Qiu**. Two oral talks "3D-Printed Dynamic Heart Model with Left-Side Anatomy and Integrated Sensor for Edge-to-Edge Repair and Regurgitation Reduction" & "3D-printed flexible microfluidic health monitor for in-situ sweat analysis and biomarker detection". In FEDSM 2026, Bellevue, WA, July 2026 (Served as an organizer for a mini symposium for Experimental (In Vitro & Ex Vivo) Methods for Biomedical Flow Analysis)

[42] **Kaiyan Qiu**. One oral talk "A Customizable, Geometry-Aware Manufacturing Framework for Modular, Multimodal Prosthetic Sensing System" and two poster presentations in 3D-printed biosensors and 3D-printed dynamic heart model. In MRS Spring 26, Honolulu, HI, April 2026

[41] **Kaiyan Qiu**. 3D-printed biomedical devices for health monitoring, multimodal sensing and surgical applications. Invited Talk, in School of Chemical and Bioengineering at Washington State University, Seattle, WA, February 2026

[40] **Kaiyan Qiu**. 3D-printed biomedical devices for health monitoring, multimodal haptics and surgical applications. Invited Talk, in Department of Rehabilitation Medicine at University of Washington, Seattle, WA, January 2026

[39] **Kaiyan Qiu**. 3D-printed biomedical devices for health monitoring, haptic sensing and surgical applications. Invited Talk, in Biomechanics Seminar at Department of Mechanical Engineering at University of Washington, Seattle, WA, January 2026

[38] **Kaiyan Qiu**. 3D-printed biomedical devices for health monitoring, haptic sensing and surgical applications. Invited Talk, in the Veterans Affairs (VA) Center for Limb Loss and Mobility, Seattle, WA, January 2026

[37] **Kaiyan Qiu**. 3D-printed biomedical devices for health monitoring, haptic sensing and surgical applications. Invited Talk, in Mechanical Engineering, University of British Columbia, Vancouver, BC, Canada, November 2025

[36] **Kaiyan Qiu**. 3D-printed wearable biosensors for health monitoring. Oral Presentation in SES 2025, Atlanta, GA, October 2025 (Served as an organizer for a mini symposium about soft electronics)

[35] **Kaiyan Qiu**. '3D-printed wearable biosensors and electronics.' Oral Presentations for *two Symposiums SB02 and SB03 in MRS Spring 2025*, Seattle, WA, April 2025 (Served as a Session Chair in Symposium SB02)
- ❖ My PhD student's poster was nominated for MRS Best Poster Award.

[34] **Kaiyan Qiu**. '3D-printed wearable sensors and artificial organs.' Poster Presentation for *GRC 2024 3D Printing Soft Materials*, Bryant University, Rohde Island, August 2024

[33] **Kaiyan Qiu**. '3D-printed biomedical and biomimetic devices.' Oral Talk for *ACS NORM 2024*, Pullman, WA, June 24, 2024

[32] **Kaiyan Qiu**. '3D-printed biomedical and biomimetic devices.' Oral Talk for Mechanical Engineering, Oregon State University, May 2024

[31] **Kaiyan Qiu**. 'AI for Materials and Manufacturing.' *3rd Annual AAAI Workshop on AI to Accelerate Science and Engineering*, Vancouver, BC, Canada, February 2024. (Served as an organizer with Jana Doppa, Aryan Deshwal, Syrine Belakaria, and Yolanda Gil)

[30] **Kaiyan Qiu**. '3D-printed biomedical and biomimetic devices.' Oral Talk for *ASME International Mechanical Engineering Congress and Exposition*, New Orleans, LA, October 29-November 2, 2023

[29] **Kaiyan Qiu**. '3D-printed biomedical and biomimetic devices.' Invited Distinguished Research Seminar for *Hong Kong Polytechnic University*, September 28, 2023

[28] **Kaiyan Qiu**. '3D printed functional devices for health monitoring.' Guest Lecture for *Biomedical Engineering, Washington State University*, Nov. 28, 2022

[27] **Kaiyan Qiu**. '3D printed functional devices for healthcare and engineering applications.' Poster Presentation, for *Gordon Research Conference: Additive Manufacturing of Soft Materials*, Ventura, CA, August 7-12, 2022

[26] **Kaiyan Qiu**. '3D printed artificial organs and smart electronics for biomedical applications.' Invited Talk for *NextFlex*, June 2022

[25] **Kaiyan Qiu**. '3D printed artificial organs and smart electronics for biomedical and healthcare applications.' Oral Invited Talk for *ACS Spring 2022*, San Diego, CA, March 22, 2022

[24] **Kaiyan Qiu**. '3D printed artificial organs and smart electronics for biomedical and healthcare applications.' Guest Lecture for *Bioengineering, Washington State University*, February 18, 2022

[23] **Kaiyan Qiu**. '3D printed artificial organs and smart electronics for biomedical and healthcare applications.' Oral Invited Talk for *Mechanical Engineering Program, Washington State University Tri-Cities*, January 28, 2022

[22] **Kaiyan Qiu**. '3D printed presurgical organ models for surgical applications.' Guest Lecture for *University of Nebraska Lincoln*, March 25, 2021

[21] **Kaiyan Qiu**. '3D printed artificial organs and smart electronics for biomedical and healthcare applications.' Guest Lecture for *Bioengineering, Washington State University*, March 5, 2021

[20] **Kaiyan Qiu**. '3D printed artificial organs and smart electronics for biomedical and healthcare applications.' Guest Lecture for *Chemical Engineering and Bioengineering, Washington State University*, November 9, 2020

[19] **Kaiyan Qiu**. '3D printed artificial organs.' Guest Lecture for *MSE 110, Washington State University*, October 8, 2020

[18] **Kaiyan Qiu**. '3D printed smart electronics.' Guest Lecture for *MSE 110, Washington State University*, October 1, 2020

[17] **Kaiyan Qiu**. '3D printed artificial organs and smart electronics for biomedical and healthcare applications.' Oral Invited Talk for *MME, Washington State University*, September 10, 2020

[16] **Kaiyan Qiu**. '3D printed artificial organs and smart electronics for biomedical and healthcare applications.' Oral Invited Talk for *Washington State University*, April 23, 2020

[15] **Kaiyan Qiu**. '3D printed artificial organs and smart electronics for biomedical and healthcare applications.' Oral Invited Talk for *University of Tennessee*, March 31 & April 1, 2020

[14] **Kaiyan Qiu**. '3D printed artificial organs and smart electronics for biomedical and healthcare applications.' Oral Invited Talk for *Florida Institute of Technology*, March 27, 2020

[13] **Kaiyan Qiu**. '3D printed artificial organs and smart electronics for biomedical and healthcare applications.' Oral Invited Talk in *University of Georgia*, Athens, GA, January 23, 2020

[12] **Kaiyan Qiu**. '3D printed organ models and flexible electronics for biomedical applications.' Oral Invited Talk in *Mississippi State University*, Starkville, MS, January 8, 2020

[11] **Kaiyan Qiu**. '3D printed models of the aortic valve.' Oral Invited Talk in *2019 Earl E. Bakken Surgical Device Symposium: Update on Surgical Aortic Disease*, Minneapolis, MN, November 8, 2019

[10] **Kaiyan Qiu**. '3D printed organ models with physical properties of tissue and integrated sensors.' Oral Invited Talk in *Micro- and Nanotechnology Sensors, Systems, and Applications XI* in *SPIE Defense + Commercial Sensing*, Baltimore, MD, April 14, 2019
- ❖ Proceedings Volumes 10982, https://doi.org/10.1117/12.2518370

[9] **Kaiyan Qiu**. **'**3D printed organ models with integrated electronics.' Oral Invited Talk in *University of Georgia*, Athens, GA, February 21, 2019

[8] **Kaiyan Qiu**, Michael C. McAlpine. '3D printed organ models with physical properties of tissue and integrated sensors.' Oral Presentation & Poster Presentation (03/20/18 & 03/19/18) in *255th ACS National Meeting & Exposition*, New Orleans, LA, 2018 (Selected as ACS Sci-Mix Poster)

[7] **Kaiyan Qiu**, M. C. McAlpine. '3D printed tissue-simulated organ model using designed synthesized polymeric inks and human organ data.' Oral Presentation (08/23/16) in *252th ACS National Meeting & Exposition*, Philadelphia, PA, 2016

[6] **Kaiyan Qiu**, M. C. McAlpine. '3D printed bionic prostate.' Oral Presentation (04/01/16) in *2016 Spring MRS Meeting & Exhibit*, Phoenix, AZ, 2016

[5] **Kaiyan Qiu**, M. C. McAlpine, R. M. Sweet. 'Patient specific 3D printed prostate with tissue and anatomic fidelity.' Poster Presentation in *Engineering & Urology Society 31th Annual Meeting*, San Diego, CA, 2016

[4] **Kaiyan Qiu**, U. G. K. Wegst. 'The structure and performance of freeze-cast bacterial cellulose aerogels.' Poster Presentation in *2013 MRS Fall Meeting & Exhibit*, Boston, MA, 2013

[3] **Kaiyan Qiu**, A. N. Netravali. 'Biodegradable polymer nanocomposites using polyvinyl alcohol and nanomaterials.' Poster Presentation in *2012 Fiber Society Fall Meeting*, Boston, MA, 2012

[2] **Kaiyan Qiu**, Anil N. Netravali. ''Green' composites using soy protein resin and novel low cost carbon source based bacterial cellulose.' Poster Presentation in for *2011 Fiber Society Fall Meeting*, Charleston, SC, 2011

[1] Feng Hong, **Kaiyan Qiu**. 'Mutation of Acetobacter xylinum for high-yield production of bacterial cellulose.' Presentation in *234th ACS National Meeting & Exposition*, Boston, MA, August 19-23, 2007

STUDENTS MENTORING

Student Mentoring at WSU and in Washington (WA)

- WSU MSE PhD student (Chuchu Chen) — *Fall 2021-May 2025*
- WSU MSE PhD student (Yonghao Fu) — *Summer 2023-Present*
- WSU ME PhD student (Hongyi Shen) — *Fall 2024-Present*
- WSU MSE PhD student (Alejandro G. Obando) — *Fall 2023-Present*
- WSU ME PhD student (Sonja Sargent Sparks, undergraduate researcher in group since 2021) — *Fall 2023-Present*
- WSU BioE Undergraduate (Samar Patil) — *Fall 2025-Present*
- WSI ME Undergraduate (Grace Allen) — *Spring 2026-Present*
- WSU ME Undergraduate (Herry Kirkwood) — *Spring 2026-Present*
- WSU ME Undergraduate (Martin Lyndell) — *Summer 2024-Present*
- WSU ME Undergraduate (Nikolai K. Bogdev) — *Fall 2024-Present*
- WSU ME Undergraduate (Jose L. Policarpio) — *Spring 2024-Present*
- WSU ME Undergraduate (Myles M. McGovern) — *Spring 2024-Fall 2025*
- WSU ME Undergraduate (Yushen Zhang) — *Fall 2024-Fall 2025*
- WSU ME Undergraduate (Matthew M. Demorse) — *Spring 2023*
- WSU ChemE Undergraduate (Xinlan Wen) — *Summer 2022*
- WSU ME Undergraduate (Jasper Allan Ellingson) — *Spring 2022*
- WSU MSE 425 undergraduates (Petra A. Jonson, co-advised with Dr. Nara Boddeti) — *Spring 2022*
- WSU ME PhD student (Jin Miao, health issue since 2022) — *Fall 2021-Spring 2023*
- WSU ME PhD student (Shihab Ahmed, co-advised with Nestor Preze) — *Fall 2022*
- Summer high school volunteers (Vivien Lin, Pullman High School) — *Summer 2025*
- Summer high school volunteers (Ryan Shi, Pullman High School) — *Summer 2025*
- Summer high school volunteers (Darryl Fu, Pullman High School) — *Summer 2024*
- Summer high school volunteers (Eric Chen, Garnet Valley High School) — *Summer 2023*
- Summer high school volunteers (Ambrose Wang, Pullman High School) — *Summer 2022*
- Tesla STEM High School student, Redmond, WA (Rhea Kuppa, 11th grade) — *Fall 2021*
  Topic: "3D Printing Bio-Inspired Heart Valves to Increase Efficiency of Pre-operative Care"
  The first place in Central Sound Regional Research and Engineering Fair (CSRSEF)
  The first place in Washington State Science and Engineering Fair (WSSEF).
- WSU ME undergraduate (George Sam Eralil) — *Spring 2021*
- WSU MSE 425 undergraduates (1. Hilal Al Harmali; 2. Zhuocheng Huang; 3. Badar Al Hosni) — *Fall 2020*

Serving as a Committee Member for Graduate Students at WSU

- Nathaniel W. Zuckschwerdt — *October 2024-Present*

- Bryson N. White, ME MS/PhD *January 2024-Present*
- Cassandra L. Orozco, ME MS *October 2023-July 2024*
- Rachel Kennedy, *ChemE MS* *July 2023-Present*
- Kimberlee Hughes, ME PhD *December 2022-Present*
- Zihui Zhao, IIDP PhD *December 2020-Present*
- Luiz Longo, ME MS *September 2021-April 2022*
- Zhaoyuan Lyu, ME PhD *October 2021-April 2022*
- Shahriar Safaee, MSE PhD *October 2020-August 2021*

Student Mentoring before WSU

- ME PhD student (UMN Total 1) *2018-2020*
- MSE, ME, ChemE undergraduates (Total 7) *2007-2018*
  - A. Shortell, A. Wolford, J. Burno (Cornell);
  - D. Jutras (REU at Cornell, from Mount Holyoke College);
  - M. Silva, R. Tu (Dartmouth);
  - K. Levac (UMN)
- High school students (Total 3) *2017-2018*
  - A. Anderson, S. Ma, and N. Tank (Breck School, MN)
  - All three high school students received a number of awards based on their work in the lab.

TEACHING

Teaching at WSU

- Course Instructor for Undergraduate Level Course 3D-Printing of Biomedical Devices (Planned) *Fall, 2026*
- Course Instructor for ME 312 Manufacturing Engineering *Spring, 2026*
- Course Instructor for ME 216 Integrated CAD Design *Spring, 2026*
- Course Instructor for ME 312 Manufacturing Engineering *Fall, 2025*
- Course Instructor for ME 216 Integrated CAD Design *Spring, 2025*
- Course Instructor for ME 312 Manufacturing Engineering and ME 216 Integrated CAD Design *Fall, 2024*
- Course Instructor for ME 312 Manufacturing Engineering *Spring, 2024*
- Course Instructor for ME 216 Integrated CAD Design *Fall, 2023*
- Course Instructor for ME 579/MSE 503 3D Printing Biomedical Devices (newly developed) *Spring, 2023*
- Course Instructor for ME 216 Integrated CAD Design *Fall, 2022*
- Course Instructor for ME 216 Integrated CAD Design *Spring, 2022*
- Course Instructor for ME 216 Integrated CAD Design *Fall, 2021*
- Course Instructor for ME 312 Manufacturing Engineering/ME 310 Manufacturing Processes/ME 311 Manufacturing Processes Laboratories & ME 598 Seminar *Spring, 2021*
- Course Instructor for ME 312 Manufacturing Engineering/ME 311 Manufacturing Processes Laboratories *Fall, 2020*

Teaching before WSU

- A Lecture on Manufactured Regenerated Polymer Fibers for TXMI 3500 (Textiles) at University of Georgia *February 2019*
- A Lecture on Extrusion-based Multi-material 3D Printing for high school juniors with NIH Continuing Umbrella of Research Experience (CURE) Internship, University of Minnesota *Summer, 2018*
  A Lecture on 3D Printing Organ Models in ME 8390 (Introduction to Nanotechnology), University of Minnesota *Fall, 2016*
- TA lectures for FSAD 4660 (Textiles, Apparel, and Innovation), Cornell University *Fall, 2011*
- Lectures on Applying Clickers as an Interactive and Assessment Tool in the Chemistry Class in TA summer institute, Cornell University (a lecture was featured in Cornell Center for Teaching Innovation) *Summer, 2009*
- TA lectures for FSAD 4320 (Product Quality Assessment), Cornell University *Spring, 2009*

WSU MME COMMITTEE SERVICE

- MME Graduate Studies Committee *Fall 2024-Present*
- MME Development Committee *Fall 2022-Present*

- MME Research Committee *Fall 2022-Present*
- MME Student Success Committee *Fall 2022-Present*
- MME Undergraduate Studies Committee *Fall 2021-Spring 2022*

FACULTY DEVELOPMENT TRAINING

- Work with Industry 101 *May 17, 19, 24, 26, 2022*
- Delta Junior Faculty Institute *April 6-8, 2022*
- NETI-3E Online *June 2-3, 2021*

INUDSTRIAL AND OTHER EDUCATIONAL EXPERIENCE

- Project Leader in UMN side for Research Collaborations with Medtronic, Inc. *2018-2020*
- Outreach Chair at Translator and Interpreter Program, Cornell University *2011-2012*
- Internship at Shanghai Coastline Co., LTD., Shanghai, China *Spring, 2007*
- Internship at BASF(China), Shanghai, China *Summer, 2004*
- Undergraduate Secondary Major Diploma (July 2004) in Business Administration at Shanghai Jiaotong University *Jan. 2002-July 2004*

AWARDS & HONORS

- Nominated and elected as the Secretary, Electronic Materials Technical Committee in IMECE and ASME *2025*
- Our 3D-printed calorimetric biosensor was selected by Editor in Chief as one of the favorite paper in *ACS Sensors* for the first 10 years *2025*
- MRS Spring 2025 Best Poster Nominee for our 3D-printed hollow microneedle-based biosensor work *2025*
- Nominated and selected for attending Delta Junior Faculty Institute *2022*
- The Professorship has been named as Berry Family Assistant Professor of Mechanical Engineering *2021*
- The '3D printed organ models' paper has been selected as a Best of 2018 article by *Adv. Mater. Technol.* *2019*
- Approval of US Permanent Residency through the First Preference Extraordinary Ability EB1A *2015*
- Placed 3rd in National Textile Center (NTC) Forum Student Competition, Charleston, SC *2011*
- Placed 1st in FSAD student paper competition, Cornell University *2011*
- Liu memorial award scholarship, Cornell University *2010*
- Teaching & Research assistant scholarship, Cornell University *2007-2012*
- College graduate excellence award, Donghua University *2004*
- Several scholarships from Invista (Dupont), Coasts and Sang Ma Trust Fund *2000-2007*

PROFESSIONAL AFFILIATIONS

- Secretary of Electronic Materials Technical Committee in IMECE and ASME
- Member of American Chemical Society
- Member of American Society of Mechanical Engineering
- Member of Material Research Society
- Member of Fiber Society

SEMINAR ORGANIZER SERVICE

- Serve as a Seminar Organizer for ME598 at WSU to invite speakers and host seminars *Spring 2021*
  - The outstanding speakers include John Rogers (Northwestern U), Michael McAlpine (U of Minnesota), Zhenan Bao (Stanford), Robert Shepherd (Cornell), Anil Netravali (Cornell), and Girish Krishnan (UIUC), and Tamas Havar (Blue Origin).

GRANT & JOURNAL REVIEWER SERVICE

- ***Grants***
  - Serve as a Panelist Reviewer for NSF ECCS/CCSS Engineering Research Initiative (ERI)
  - Serve as an External Reviewer for Research Grant Council of Hong Kong
  - Serve as a Reviewer for UK Research and Innovation Funding Services
  - Serve as an External Reviewer for CATALYST Funding Program, Rowan University
  - Served as a Reviewer for grants from ACS Petroleum Research Fund

- ***Journals***
  - Proceedings of National Academy of Sciences of the United States of America (PNAS);
  - Advanced Materials;
  - Advanced Functional Materials;
  - Advanced Materials Technologies;
  - Scientific Reports;
  - Mechatronics;
  - Materials & Design;
  - Sensors;
  - MRS Communications;
  - Trends in Pharmacological Sciences;
  - ACS Macro Letters;
  - ACS Applied Materials & Interfaces;
  - ACS Sustainable Chemistry & Engineering;
  - ACS Books;
  - Journal of Materials Chemistry A;
  - Journal of Materials Chemistry B;
  - Composites Science and Technology;
  - Carbohydrate Polymers;
  - Cellulose;
  - The Journal of Physical Chemistry;
  - Composite Part A;
  - Composite Part B;
  - Composite Interfaces;
  - Polymer Chemistry;
  - RSC Advances;
  - Analyst;
  - Scanning;
  - Journal of the Brazilian Chemical Society;
  - ASME Journal of Engineering and Science in Medical Diagnostics and Therapy;
  - International Journal of Engineering, Science and Technology;
  - Journal of Renewable Materials；
  - International Journal of Biological Macromolecules;
  - Food Biophysics;
  - Food & Function;
  - Food Hydrocolloids;
  - Advanced Fiber Materials.