GEORGE T.-C. CHIU

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RESEARCH INTERESTS

Mechatronics; Dynamic Systems and Control; Digital Imaging and Printing Systems; Functional Printing and Digital Fabrication; Robotics; Perception-based Engineering; Human Motor Control; Optimal and Robust Control

EDUCATION

Ph.D. Mechanical Engineering, University of California at Berkeley, May 1994.

M.S. Mechanical Engineering, University of California at Berkeley, May 1990.

B.S. Mechanical Engineering, National Taiwan University, Taipei, Taiwan, June 1985.

PROFESSIONAL EXPERIENCE

01/18 – present	***Assistant Dean for Global Engineering Programs and Partnerships*** College of Engineering, Purdue University
08/08 – present	***Professor***
10/08 – 09/11	***Director of Professional Practice and Global Initiatives***
08/02 – 07/08	***Associate Professor***
06/96 – 07/02	***Assistant Professor*** School of Mechanical Engineering, Purdue University.
07/12 – present	***Professor*** (by courtesy) Department of Psychological Sciences, Purdue University.
08/08 – present	***Professor*** (by courtesy) School of Electrical and Computer Engineering, Purdue University.
01/17 – 12/19	***Editor-in-Chief,*** *IEEE/ASME Transactions on Mechatronics*
01/12 – 06/14	***Editor,*** *Journal of Imaging Science and Technology* Society for Imaging Science and Technology, Springfield, Virginia.
09/11 – 06/14	***Program Director*** National Science Foundation, Arlington, Virginia.
07/05 – 08/05	***Visiting Scholar*** Department of Mechanical Engineering, Waseda University, Tokyo, Japan.
02/05 – 07/05	***Visiting Associate Professor*** School of Mechanical Engineering, Shanghai Jiao Tong University, Shanghai, China.
06/00, 06/01, 06/02	***Visiting Summer Faculty*** Hewlett-Packard Company, Boise, Idaho.
04/94 - 05/96	***Hardware Design Engineer*** Hewlett-Packard Company, San Diego, California.

AWARDS AND HONORS

Fellow, American Society of Mechanical Engineers (ASME), 2013

Director's Collaboration Award, National Science Foundation, 2012

Fellow, The Society for Imaging Science and Technology (IS&T), 2011

Outstanding Volunteer Award, FIRST Robotics Competition, Boilermaker Regional, 2011

2010 IEEE Transactions on Control Systems Technology Outstanding Paper Award, Control Systems Society, IEEE, 2010

Faculty Engagement/Service Excellence Award, College of Engineering, Purdue University, 2010

Team Excellence Award, College of Engineering, Purdue University, 2006

Best Poster Session Paper and Presentation Award, NIP21: The 21st International Congress on Digital Printing Technologies, Baltimore, Maryland, September 2005

The Ruth and Joel Spira Award, School of Mechanical Engineering, Purdue University, 2004

Teaching for Tomorrow Award, Purdue University, 2000

Feddersen Fellow, School of Mechanical Engineering, Purdue University, 1996-1997

Outstanding Graduate Student Instructor, University of California, Berkeley, 1990-1991

PUBLICATIONS

Archival Journals

In review

[1] J. Wang and G.T.-C. Chiu, "Drop-on-Demand Inkjet Drop Control with One-step Look Ahead Estimation of Model Parameter," *IEEE/ASME Transactions on Mechatronics*, submitted in August 2022

[2] C. Cheng, G. Chiu, and B. Han, "Rapid Creation of Tumoroid with Tumor-stroma Interface at Extremely High Cell Density by Cell-derived Active Shrinking," *Small*, in review since April 2022

2022

[3] A. Felicelli, I. Katsamba, F. Barrios, Y. Zhang, K. Peoeples. G. Chiu, and X. Ruan, "Ultrawhite, Thin, and Lightweight Boron Nitride Nanoplatelet Paints for Daytime Radiative Cooling," *Cell Report*, accepted in August 2022

[4] Z. Siefker, J. Hodul, C. Flores-Hansen, G. Chiu, J. Braun, J. Rhoads, and B. Boudouris, "Sorption Kinetics of Poly(ethyleneimine)-Poly(ethylene oxide) Blends and the Implication for Low-Cost, Small-Scale CO_2 Sensors," *ACS Applied Polymer Materials*, May 2022, 10.1021/acsapm.2c00361

[5] C. Cheng, G.T-C. Chiu, and B. Han, "A Scaling Law of Particle Transport in Inkjet-Printed Particle-Laden Polymeric Drops," *International Journal of Heat and Mass Transfer*, April 2022, 10.1016/j.ijheatmasstransfer.2022.122840

2021

[6] Z. Siefker, X. Zhao, N. Bajaj, A. Boyina, J. Braun, G. Chiu, B. Boudouris, and J. Rhoads, "A Carbon Nanotube-Functional Polymer Composite Film for Low-Power Indoor CO_2 Monitoring," *IEEE Sensor Journal*, November 30, 2021, 10.1109/JSEN.2021.3131428

[7] M. McConnell, A. Murray, B. Boudouris, I. Gunduz, S. Son, G. Chiu, and J. Rhoads, "Conductive Polymer Spark Gap Igniters," *Propellants, Explosives, Pyrotechnics*, August 2021, 10.1002/prep.202100016

[8] Y. Wu and G. Chiu, "An Improved Model of Height Profile for Drop-On-Demand Print of Ultraviolet Curable Ink," *ASME Letters on Dynamic Systems and Control*. Vol. 1, No. 3, pp. 031010, July 2021, 10.1115/1.4050012

[9] Z.A. Siefker, J.N. Hodul, X. Zhao, N. Bajaj, K.M. Brayton, C. Flores-Hansen, W. Zhao, G.T.-C. Chiu, J.E. Braun, J.F. Rhoads, and B.W. Boudouris, "Manipulating Polymer Composition to Create Low-cost, High-fidelity Sensors for Indoor CO_2 Monitoring," *Scientific Reports*, Vol. 11, 13237, June 2021, 10.1038/s41598-021-92181-4

[10] A. Kanach, T. Bottorff, M. Zhao, J. Wang, G.T.-C. Chiu, and B. Applegate, "Evaluation of Anhydrous Processing and Storage Methods of the Temperate Bacteriophage ϕV10 for Integration into Foodborne Pathogen Detection Methodologies," *PLoS ONE*, Vol. 16, No. 4, pp. e0249473, April 2021, 10.1371/journal.pone.0249473

[11] D. Feng, J. Wang, G.T-C. Chiu, and A. Raman, "Vibration of Air-Coupled Wed Systems," *ASME Journal of Vibration and Acoustics*, Vol. 143, No. 1, pp. 011004, February 2021, 10.1115/1.4047702

[12] F. Browne, B. Rees, G.T-C. Chiu, and N. Jain, "Iterative Learning Control with Time Delay Compensation: An Application to Twin Roll Strip Casting," *IEEE Transactions on Control Systems Technology,* Vol. 29, Iss. 1, January 2021, 10.1109/TCST.2020.2971452

2020

[13] N. Bajaj, J.S. Laster, B.W. Boudouris, G.T.-C. Chiu, and J.F. Rhoads, "A Vapor Phase Trinitrotoluene Threshold Detector Enabled by Nonlinear Feedback," *IEEE Sensors Letters*, Vol. 4, Iss. 11, pp. 1-4, November 2020, Art no. 2501504, 10.1109/LSENS.2020.3032394.

[14] J.N. Hodul, A.K. Murray, N.F. Carneiro, J.R. Meseke, J. Morris, X. He, D. Zemlyanov, G.T.-C. Chiu, J.E. Braun, J.F. Rhoads, and B.W. Boudouris, "Modifying the Surface Chemistry and Nanostructure of Carbon Nanotubes Facilitates the Detection of Aromatic Hydrocarbon Gases," *ACS Applied Nano Materials* 2020, Vol. 3, No. 10, pp. 10389-10398, 10.1021/acsanm.0c02295

[15] S. Diaz-Amaya, M. Zhao, J. Allebach, G.T-C. Chiu, and L. Stanciu, "Ionic Strength Influences on Biofunctional Au-Decorated Microparticles for Enhanced Performance in Multiplexed Colorimetric Sensors," *ACS Applied Materials & Interfaces,* Vol. 12, Iss. 29, pp. 32397-32409, 10.1021/acsami.0c07636

[16] C. Cheng, Y.J. Moon, S.H. Kim, Y-C. Jeong, J.Y. Hwang, G.T-C. Chiu, and B. Han, "Water-Matrix Interaction at the Drop-Drop Interface during Drop-on-Demand Printing of Hydrogels," *International Journal of Heat and Mass Transfer*, Vol. 150, 119327, April 2020, 10.1016/j.ijheatmasstransfer.2020.119327

[17] N. Murrell, R. Bradley, N. Bajaj, J. Whitney, and G.T.-C. Chiu, "New Calibration Method for Implementing Machine Learning (ML) in Low-Cost Sensor Applications," *IEEE Sensor Letters*, Vol. 4, Iss. 2, February 2020, 10.1109/LSENS.2020.2971714

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[18] F. Browne, G.T-C. Chiu, and N. Jain, "A Nonlinear Dynamic Switched-Mode Model of Twin-Roll Steel Strip Casting," *ASME Journal of Dynamic Systems, Measurements and Control,* Vol. 141, No. 8, pp. 081004, August 2019, 10.1115/1.4042952

[19] S. Díaz-Amaya, M. Zhao, L-K. Lin, C. Ostos, J.P. Allebach, G.T-C. Chiu, A. Deering, and L.A. Stanciu, "Bio-Nanopatterning: Inkjet Printed Nanopatterned Aptamer-Based Sensors for Improved Optical Detection of Foodborne Pathogens (Small 24/2019)," *Small*, Vol. 15, 1970128, June 2019, 10.1002/smll.201970128

[20] S. Díaz-Amaya, M. Zhao, L-K. Lin, C. Ostos, J.P. Allebach, G.T-C. Chiu, A. Deering, and L.A. Stanciu, "Inkjet Printed Nanopatterned Aptamer-Based Sensors for Improved Optical Detection of Foodborne Pathogens," *Small*, Vol. 15, 1805342, April 2019, 10.1002/smll.201805342

[21] E.R. Westphal, A. K. Murray, M.P. McConnell, T.J. Fleck, G.T.-C. Chiu, J.F. Rhoads, I.E. Gunduz, and S.F. Son, "The Effects of Confinement on the Fracturing Performance of Printed Nanothermites," *Propellants, Explosives, Pyrotechnics*, Vol. 44, Iss. 1, January 2019, 10.1002/prep.201800188

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[23] I.E. Gunduz, M.S. McClain, P. Cattani, G.T.-C. Chiu, J.F. Rhoads, and S.F. Son, "3D printing of Extremely Viscous Materials Using Ultrasonic Vibrations," *Additive Manufacturing*, Vol. 22, pp. 98-103, August 2018, 10.1016/j.addma.2018.04.029

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2017

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[42] J. Mynderse and G.T.-C. Chiu, "Two Degree-of-Freedom Hysteresis Compensation for a Dynamic Mirror Actuator," *IEEE/ASME Transactions on Mechatronics*, Vol. 21, Iss. 1, pp. 29-37, February 2016, 10.1109/TMECH.2015.2493038

2014

[43] J.W. Boley, E.L. White, G.T.-C. Chiu, and R.K. Kramer, "Direct Writing Gallium-Indium Alloy for Stretchable Electronics," *Advanced Functional Materials*, Vol. 24, pp 3501-3507, June 2014, 10.1002/adfm.201303220

[44] J. Shelton and G.T.-C. Chiu, "Efficiently Generating the Ballistic Phase of Human-like Aimed Movement," *IEEE/ASME Transactions on Mechatronics*, Vol. 19, Iss. 6, pp. 1839 – 1846, December 2014, 10.1109/TMECH.2014.2316156

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2013

[46] A. Adak, J.W. Boley, D. Lyvers, G.T. Chiu, P. Low, R. Reifenberger, and A. Wei, "Label-free Detection of Staphylococcus Aureus Captured on Immutable Ligand Microarrays," *ACS Applied Materials & Interfaces*, Vol. 5, Iss. 13, pp. 6404-6411, July 10, 2013 10.1021/am4016236;

[47] M.H. Cheng, G.T.-C. Chiu and M.A. Franchek, "Real-Time Measurement of Eccentric Motion with Low-Cost Capacitive Sensor," *IEEE/ASME Transactions on Mechatronics*, Vol. 18, iss. 3, pp. 990-997, June 2013, 10.1109/TMECH.2012.2195323

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[49] V. Kumar, Y. Yang, J.W. Boley, G.T.-C. Chiu, and J.F. Rhoads, "Modeling, Analysis, and Experimental Validation of a Bifurcation-Based Microsensor," *IEEE/ASME Journal of Microelectromechanical Systems*, Vol. 21, No. 3, pp. 549-558, May 2012, 10.1109/JMEMS.2011.2182502

[50] Y.-F. Kuo, C.-L. Yang, G. T.-C. Chiu, Y. Yih, J. P. Allebach, and C. D. Geleynse, "Experimental Characterization of Transient Tone Deviation in Print Jobs for Color Electrophotography," *Journal of Imaging Science and Technology*, Vol. 56, No. 2, p. 020502, February/March 2012, 10.2352/J.ImagingSci.Technol.2012.56.2.020502

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[51] Y.-F. Kuo, C.-L. Yang, G.T.-C. Chiu, Y. Yih, J.P. Allebach, and D.A. Abramsohn, "Model-based Calibration Approach to Improve Tone Consistency for Color Electrophotography," *Journal of Imaging Science and Technology*, Vol. 55, No. 6, pp. 1-9, November/December 2011, 10.2352/J.ImagingSci.Technol.2011.55.6.060505

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[54] V. Kumar, J.W. Boley, Y. Yang, H. Ekowaluyo, J.K. Miller, G.T.-C. Chiu, and J.F. Rhoads, "Bifurcation-based Mass Sensing using Piezoelectrically-actuated Microcantilevers," *Applied Physics Letters*, Vol. 98, Iss. 15, p. 153510, April 2011, 10.1063/1.3574920

[55] O-S. Kwon, H. N. Zelaznik, G. Chiu, and Z. Pizlo, "Human Motor Transfer is Determined by the Scaling of Size and Accuracy of Movement," *Journal of Motor Behavior*, Vol. 43, Iss. 1, pp. 15-26, 2011. 10.1080/00222895.2010.520359

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2009

[60] P-J Chiang, N. Khanna, A.K. Mikkilineni, M.V. Ortiz Segovia, S. Suh, J.P. Allebach, G.T.-C. Chiu, and E.J. Delp, "Printer and Scanner Forensics," *IEEE Signal Processing Magazine*, Vol. 26, Iss. 2, pp. 72-83, March 2009, 10.1109/MSP.2008.931082

2008

[61] H.-M. Cheng and G.T. Chiu, "Wordlength Estimation of Digital Controller Synthesis for Inkjet Printer Mechanism," *Journal of Computers*, Vol. 3, No. 4, pp. 50-57, April 2008, 10.4304/jcp.3.4.50-57

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2010 IEEE Transactions on Control Systems Technology Outstanding Paper Award

[66] C.-Y. Chen, L.-Q. Liu, P.-S. Liao, and G.T.-C. Chiu, "Fuzzy Controller Design for Synchronous Motion in a Dual-Cylinder Electro-Hydraulic System," *IFAC Journal of Control Engineering Practice*, Vol. 16, pp. 658-673, June 2008, 10.1016/j.conengprac.2007.08.005

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PATENTS AND APPLICATIONS

[1] B. Han, G. T.-C. Chiu, T. Siegmund, M. Lennes, Y. Wu, and M. Short, "Collapsible Basket Array, Collapsible Cellular Array, Therefor, and Methods of Use," **US patent No. 11,273,447**, March 15, 2022 – Purdue

[2] F.M. Browne, N. Jain, and G. Chiu, "Iterative Learning Control for Periodic Disturbances in Twin-Roll Strip Casting with Measurement Delay," **US Patent No: 11,135,647 B2**, October 5, 2021 – Nucor

[3] N. Bajaj, G. T.-C. Chiu, J. Houston, and R. Morris, "Coherent Phase Switching and Modulation of a Linear Actuator Array," **US Patent No: 11,132,062 B2**, September 28, 2021 – General Vibration

[4] J. Rhoads, G.T.-C. Chiu, and N. Bajaj, "Nonlinear Mass Sensors Based on Electronic Feedback," **US Patent No: 11,060,998**, July 13, 2021 – Purdue

[5] J.F. Rhoads, G.T.-C. Chiu, I.E. Gunduz, T.J. Fleck, A.K. Murray, and S.F. Son, "3D Printed Fluoropolymer-Based Energetic Compositions," **US Patent No: 11,027,484 B2**, June 8, 2021 – Purdue

[6] J.F. Rhoads, E.A. Nauman, M. Tweardy, M. Wadas, A.K. Murray, G.T.-C. Chiu, and N. Bajaj, "Method of Detecting a Substance," **US Patent No: US10,948,489 B2**, March 16, 2021 – Purdue

[7] J.F. Rhoads, I.E. Gunduz, S.F. Son, and G.T.-C. Chiu, "Methods and Apparatus for 3D Printing of Highly Viscous Materials," **US Patent No: 10,870,234 B2**, December 22, 2020 – Purdue (licensed to Next Offset)

[8] F.M. Browne, N. Jain, and G. Chiu, "Iterative Learning Control for Periodic Disturbances in Twin-Roll Strip Casting with Measurement Delay," **US Patent No: 10,449,603 B2**, October 22, 2019 – Nucor

[9] J. Rhoads, N. Bajaj, G.T.-C. Chiu and A. Sabater, "Nonlinear Mass Sensors Based on Electronic Feedback and Methods of using The Same," **US Patent No: 10,072,969 B2**, September 11, 2018 – Purdue

[10] X. Deng, J. Zheng, and G.T.-C. Chiu, "Mobile Device Enabled Robotic System," **US Patent No: 9,954,992**, April 24, 2018 - Purdue

[11] J. Rhoads, N. Bajaj, G.T.-C. Chiu and A. Sabater, "Nonlinear Mass Sensors Based on Electronic Feedback and Methods of using The Same," **US Patent No: 9,927,287**, March 27, 2018 - Purdue

[12] Y.F. Kuo, C.L. Yang, G. Chiu, Y. Yih, J.P. Allebach, D.A. Abramsohn, "Tone Reproduction Curve Error Reduction," **US Patent No: 9,014,578 B2**, April 21, 2015 – Purdue & HP

[13] J.H. Yi, D. Baang, G. Chiu, and M. Mukhtar, "Scanner, Image Forming Apparatus, and Motor Control Method of Scanner and Image Forming Apparatus" **US patent No. 8,414,096 B2**, April 9, 2013 (South Korean and Chinese patents also granted) - Samsung

[14] C.L. Chen and G. T.-C. Chiu, "Systems and Methods for Reducing Banding Artifact in Electrophotographic Devices Using Drum Velocity Control," **US patent No. 6,456,808**, September 24, 2002 – Purdue and HP

[15] G.A. Ingram, M.A. Franchek, G.T. Chiu, and R.G. Ingram, "Power Management System and Method," **US patent No. 6,427,107**, July 30, 2002 – Caterpillar

[16] K.A. Williams, G.T-C. Chiu, and R.J. Bernhard, "Vibration Absorber Using Shape Memory Material," **US patent No. 6,290,037**, September 18, 2001 – Purdue

[17] J.F. Rhoads, G.T.-C. Chiu, B.W. Boudouris, N. Bajaj, A.K. Murray, Z.A. Siefker, and X. Zhao, "CO_2 Sensor Based on Carbon Nanotube-Functional Polymer Composite Films," US Patent Application: 16/986340, February 11, 2021

[18] L. Stanciu-Gregory, J.P. Allebach, G. T.-C. Chiu, L.S. Diaz, and M. Zhao, "Multifluidic Device and Processing System for Colorimetric Multiplexed Detection of a Substance," US Patent Application: 17/161287, January 28, 2021

[19] B. Han, G. T-C. Chiu, and C. Cheng, "Methods and Materials for Rapid Preparation of 3D Spheroids/Organoids," US Patent Application: 17/108009, February 3, 2020

INVITED SPEAKER AND PANELIST

[1] 2021 IEEE Conference on Control Technology and Applications (CCTA), San Diego, California, "Modeling and Control of Digital Printing and Imaging Systems," August 10, 2021 (**Keynote**)

[2] 2019 International Conference on Mechanical Engineering Education, Shanghai, China, "Leveraging Strategic Collaborations to Develop Global Competence – the Purdue Engineering Approach," October 27, 2019

[3] 2019 IEEE International Conference on Real-Time Computing and Robotics (RCAR), Irkutsk, Russia, "Monitoring and Control of Digital Printing and Imaging Systems," August 6, 2019 (**Plenary**)

[4] 2019 IEEE/ASME International Conference on Advanced Intelligent Mechatronics (AIM), Hong Kong, "Digital Imaging and Printing Systems – Old Dog with New Tricks," July 9, 2019 (**Plenary**)

[5] Nanyang Technological University, Singapore, "Embedded Implementation of Support Vector Machines Classification for Process Monitoring and Control," April 15, 2019

[6] Automation 2018, Taichung, Taiwan, "Modeling and Control of Digital and Functional Printing and Imaging Systems," December 7, 2018 (**Keynote**)

[7] Cultivation and Research of Interdisciplinary Engineering Education Annual Workshop, Taichung, Taiwan, "Developing Global Competence in Engineering Curriculum – the Purdue Engineering Approach," November 9, 2018 (**Keynote**)

[8] Advance Robotics and Artificial Intelligent Seminar Series, Nankai University, China, "Writing a Journal Paper and Getting It Published – Impedance Matching," July 23, 2018

[9] 2018 IEEE CYBER Conference, Tianjin, China, "Making of a Microresonator-based Sensor – Dynamics, Feedback and Functional Printing," July 22, 2018 (**Plenary**)

[10] 2018 International Conference on Integrated Automation, Tongji University, Shanghai, China, "Embedded Implementation of Support Vector Machines Classification for Process Monitoring and Control," June 23, 2018

[11] Chinese Academy of Science, Beijing, China, "Efficient Generation of Human-like Kinematics in the Ballistic Phase of Point-to-Point Movement," November 21, 2017

[12] Tsing Hua University, Beijing, China, "Making of a Microresonator-based Sensor – Feedback and Functional Printing," November 20, 2017

[13] Yonsei University, Seoul, South Korea, "Embedded Implementation of Support Vector Machines Classification for Process Monitoring and Control," June 7, 2017

[14] Control Systems Forum, Missouri University of Science and Technology, Rolla, Missouri, "Modeling and Control of Digital Printing and Imaging Systems," April 13, 2017

[15] Interaction Meeting of Indo-US R&D Networked Joint Center on Nanomaterials for Clean Energy and Environmental Sensors, Bengaluru, India, "Real-time Defect Detection and Classification for Roll-to-Roll Gravure Coating of Cellulose Nanocrystal Thin Films," March 13, 2017

[16] City University of Hong Kong, Hong Kong, "Functional Inkjet Printing – Opportunities and Challenges," November 21, 2016

[17] 2016 Science, International Robotics Alliance Conference, Foshan, China, "Embedded Implementation of Machine Learning with Human Guidance," September 27, 2016 (**Keynote**)

[18] Workshop on Intelligent Manufacturing, 2016 IEEE International Conference on Advanced Intelligent Mechatronics (AIM), Banff, Canada, "Recent Results Addressing Embedding Support Vector Machines (SVM) for Process Monitoring and Control," July 12, 2016 (Panelist)

[19] University of Texas at Austin, Austin, Texas, "Functional Inkjet Printing – Opportunities and Challenges," November 4, 2015 (**Chevron Frontier of Mechanical Engineering Distinguished Lecture**)

[20] Singapore University of Technology and Design, Singapore, "Functional Inkjet Printing – Opportunities and Challenges," October 22, 2015

[21] Ohio State University, Columbus, Ohio, "Recent Results in Addressing Embedded Implementation of Support Vector Machines (SVM)," September 11, 2015

[22] The 1st International Conference on Advanced Imaging, Tokyo, Japan, "Print Mask Design and Drop Volume Modulation for Functional Inkjet Printing," June 17, 2015 (**Invited Lecture**)

[23] Shanghai Jiao Tong University, Shanghai, China, "Mechatronics Engineering – Challenges and Opportunities," May 19, 2015

[24] Jawaharlal Nehru Centre for Advanced Scientific Research, Bangalore, India, "Process Control for Inkjet Printing of Functional Materials," March 19, 2015

[25] University of Newcastle, Newcastle, Australia, "Mechatronics Engineering – Research and Education," December 5, 2014

[26] United Technology Research Center, Hartford, Connecticut, "Modeling and Control of Digital Printing Systems and its Application to Functional Printing," July 24, 2014

[27] Workshop on Intelligent Manufacturing, 2014 IEEE/ASME International Conference on Advanced Intelligent Mechatronics (AIM), Besançon, France, "Functional Inkjet Printing – Addressing Material-Substrate-Material Interaction," July 7, 2014 (Panelist)

[28] Rutgers, The State University of New Jersey, New Jersey, "Print Mask Design to Address Material-Substrate Interaction in Functional Inkjet Printing," February 12, 2014

[29] The 2nd International Conference on Intelligent Technologies and Engineering Systems (ICITES 2013), Kaohsiung, Taiwan, "Functional Inkjet Printing – Integrate Material and Process to Deliver Functionality," December 13, 2013 (**Keynote**)

[30] National Taiwan University, Taipei, Taiwan, "Functional Inkjet Printing – Integrate Material and Process to Deliver Functionality," December 5, 2013

[31] National Taiwan Science and Technology University, Taipei, Taiwan, "Functional Inkjet Printing – Integrate Material and Process to Deliver Feature," December 4, 2013

[32] 2013 CACS International Automatic Control Conference, Sun Moon Lake, Nantou, Taiwan, "Control for Smart Manufacturing," December 3, 2013 (Invited Panelist)

[33] Lexmark Career Start Symposium, Lexington, Kentucky, "Making Industry-University Collaboration Work – a Personal Perspective," July 25, 2013

[34] Hubei Industrial University, Wuhan, China, "Efficient Generation of Human-like Kinematics in the Ballistic Phase of Point-to-Point Movement," July 2, 2013

[35] Huazhong University of Science and Technology, Wuhan, China, "Efficient Generation of Human-like Kinematics in the Ballistic Phase of Point-to-Point Movement," July 1, 2013

[36] Dynamic Walking 2013 Annual Meeting, Pittsburg, Pennsylvania, "The National Robotic Initiative and Beyond," June 10, 2013

[37] The 3rd IFAC Symposium on Mechatronic Systems, Hangzhou, China, "Future Education in Mechatronics," April 12, 2013 (panelist)

[38] University of Florida, Gainesville, Florida, "Efficient Generation of Human-like Kinematics in the Ballistic Phase of Point-to-Point Movement," March 21, 2013

[39] University of Florida, Gainesville, Florida, "New Initiatives and Updates for Dynamic Systems and Control from the National Science Foundation," March 21, 2013

[40] University of Minnesota, Minneapolis, Minnesota, "New Initiatives and Updates for Dynamic Systems and Control from the National Science Foundation," October 31, 2012

[41] Villanova University, Villanova, Pennsylvania, "New Initiatives and Updates for Dynamic Systems and Control from the National Science Foundation," September 21, 2012

[42] 2012 IEEE/ASME International Conference on Advanced Intelligent Mechatronics, Kaohsiung, Taiwan, "The Era of cloud Computing and Service Innovation: The Implication and Perspectives of Intelligent Mechatronics," July 13, 2012 (panelist)

[43] Jiangsu Police Institute, Nanjing, China, "Printer and Sensor Forensics: Intrinsic and Extrinsic Signatures," December 12, 2011

[44] 2011 RoSEC Winter School, Seoul, South Korea, "Perception-based Engineering," January 12, 2011

[45] 2011 RoSEC Winter School, Seoul, South Korea, "End-of-Line Calibration of Repetitive Color Registration Error," January 13, 2011

[46] International Conference on Engineering Design and Optimization, Ningbo, China, "Maintain Color Consistency – Modeling and Control of a Two-component Xerographic Development Process," October 28, 2010 (Keynote)

[47] Waseda University, Tokyo, Japan, "Iterative Feedforward Repetitive Disturbance Rejection with Application to Document Scanners," June 21, 2010

[48] University of Houston, Houston, Texas, "Maintain Color Consistency – Modeling and Control of a Two-component Xerographic Development Process," June 14, 2010

[49] National Chung Hsin University, Taiwan, "Iterative Feedforward Repetitive Disturbance Rejection with Application to Document Scanners," June 11, 2010

[50] National Chung Cheng University, Taiwan, "Iterative Feedforward Repetitive Disturbance Rejection with Application to Document Scanners," June 10, 2010

[51] Cheng Shiu University, Kaohsiung, Taiwan, "Iterative Feedforward Repetitive Disturbance Rejection with Application to Document Scanners," June 9, 2010

[52] Shanghai Jiao Tong University, Shanghai, China, "Recent Advances in Modeling and Control of Digital Imaging and Printing Systems," December 18, 2009

[53] Harbin Institute of Technology, Harbin, China, "Modeling and Control of Digital Imaging and Printing Systems," June 23-25, 2009

[54] Ricoh Company, Ebina, Japan, "Recent Research in the Modeling and Control of Digital Printing and Imaging Systems," June 17, 2009

[55] Zhejiang University, Hangzhou, China, "Functionalize Microcantilever Sensor Array Using Inkjet Drop-on-Demand," November 18, 2008

[56] Samsung Electronics, Suwon, South Korea, "Functionalization of Microcantilever Sensor Array Using Inkjet Drop-on-Demand," July 9, 2008

[57] University of Washington, Seattle, Washington, "Modeling and Control of the Development Process in Electrophotography," November 30, 2007

[58] ABET Annual Meeting, Lake Tahoe, Nevada, "The Purdue Global Engineering Alliance for Research and Education (GEARE) Program," November 6, 2007

[59] United Technology Research Centers, Harford, Connecticut, "Identification of Color Banding Threshold for Laser Printers," February 27, 2007

[60] Georgia Institute of Technology, Atlanta, Georgia, "Modeling and Control of a Two-Component Xerographic Development Process," December 8, 2006

[61] University of Michigan, Ann Arbor, Michigan, "Modeling and Control of a Two-Component Xerographic Development Process," November 17, 2006

[62] Bank of Canada, Ottawa, Canada, "Printer and Sensor Forensics," November 10, 2006 (with Dr. E Delp)

[63] National Kaohsiung University of Applied Science, Kaohsiung, Taiwan, "Disturbance Observer Based Commutation Torque Estimation for Brushed Permanent Magnet Direct Current Motors – Modeling and Experimental Verification," October 24, 2006

[64] Cheng Shiu University, Kaohsiung, Taiwan, "Disturbance Observer Based Commutation Torque Estimation for Brushed Permanent Magnet Direct Current Motors – Modeling and Experimental Verification," October 23, 2006

[65] Yokohama National University, Yokohama, Japan, "Spatial Sampled Linear Parameter Varying Repetitive Control (LPVRC) – Disturbance Rejection in Electrophotography," July 13, 2006

[66] Indiana University Purdue University Indianapolis (IUPUI), "Modeling and Control of Electrophotography: From Artifact Reduction to Signature Embedding," April 6, 2006

[67] Feng Chia University, Taichung, Taiwan, "Banding in Electrophotography: From Artifact Reduction to Signature Embedding," October 6, 2005

[68] National Changhua University of Education, Changhua, Taiwan, "Finite Precision Controller Implementation – Explore the Coupling between Sample Rate and Wordlength," October 5, 2005

[69] National Chung Hsin University, Taichung, Taiwan, "Banding in Electrophotography: From Artifact Reduction to Signature Embedding," October 5, 2005

[70] Waseda University, Kamogawa, Japan, "Campus Life for Engineering/Science Students in the United States," July 30, 2005

[71] Waseda University, Tokyo, Japan, "Color Banding Metric and Digital Printing Research at Purdue University," July 27, 2005

[72] Waseda University, Tokyo, Japan, "Banding in Electrophotography: From Artifact Reduction to Signature Embedding," July 21, 2005

[73] Zhejiang University, Hangzhou, China, "Periodic Disturbance Rejection in Electrophotography – Spatial Sampled Linear Parameter Varying Repetitive Control," June 25, 2005

[74] National Chiao Tong University, Hsinchu, Taiwan, "Extremum Seeking Control of Tunable Thermoacoustic Devices," May 11, 2005

[75] Shanghai Jiao Tong University, Shanghai, China, "Periodic Disturbance Rejection in Electrophotography – Spatial Sampled Linear Parameter Varying Repetitive Control," November 24, 2004

[76] National Changhua University of Education, Changhua, Taiwan, "Active and Adaptive-Passive Control of Acoustic Impedance Matching for Thermoacoustic Coolers," October 22, 2004

[77] National Central University, Chungli, Taiwan, "Active and Adaptive-Passive Control of Acoustic Impedance Matching for Thermoacoustic Coolers," October 19, 2004

[78] National Tsinghua University, Hsinchu, Taiwan, "Periodic Disturbance Rejection in Electrophotography – Spatial Sampled Linear Parameter Varying Repetitive Control (LPVRC)," July 15, 2004

[79] Sipix Imaging, Inc., Fremont, California, "Application of Electrophotography in Printing Electronic Paper," June 2004.

[80] Rice University, Houston, Texas, "How to Make Pleasing Print Outs Cheap and Fast? – Disturbance Rejection in Electrophotography," April 23, 2004

[81] University of Houston, Houston, Texas, "How to Make Pleasing Print Outs Cheap and Fast? – Disturbance Rejection in Electrophotography," April 22, 2004

[82] Waseda University, Tokyo, Japan, "Closed Loop Control of Electrophotographic Process – Sensitivity Reduction," July 24, 2003

[83] Ricoh Research and Development Center, Yokohama, Japan, "Closed Loop Control of Electrophotographic Process – Sensitivity Reduction," June 20, 2003.

[84] Institute of Industrial Science, University of Tokyo, Tokyo, Japan, "Artifact Rejection in Electrophotography using Linear Parameter Varying (LPV) System Formulation," June 19, 2003.

[85] National Taiwan University, Taipei, Taiwan, "Artifact Rejection in Electrophotography using Linear Parameter Varying (LPV) System Formulation," June 13, 2003.

[86] Metal Industries Research & Development Centre, Kaohsiung, Taiwan, "Perception Engineering and Mechatronics – Artifact Reduction in Electrophotographic Processes," December 24, 2002.

[87] National Chiao-Tung University, Hsinchu, Taiwan, "Perception Engineering and Mechatronics – Artifact Reduction in Electrophotographic Processes," December 20, 2002.

[88] Xerox Corporation, Webster, New York, "Sensing and Control of Digital Color Xerographic Imaging Systems," August 27, 2001, (with Dr. P. Li).

[89] Swiss Federal Institute of Technology Lausanne (EPFL), Lausanne, Switzerland, "Artifact Reduction in Digital Printing – a Need for Integrating Image Processing, Visual Perception and Process Control," July 16, 2001.

[90] University of Illinois at Chicago, Chicago, Illinois, "Mechatronics – a Design Paradigm Shift and Its Applications," November 20, 2000.

[91] Hewlett-Packard Company, Boise, Idaho, "Banding Reduction in Electrophotographic Processes," June 16, 2000.

[92] Xerox Corporation, Webster, New York, "Mechatronics and Its Application in Document Printing Systems," May 18, 2000.

[93] University of Michigan, Ann Arbor, Michigan, "Artifact Reduction in Electrophotographic Processes," March 31, 2000.

[94] Unisys Corporation, Detroit, Michigan, "Developing Medium Volume Paper Handling Mechanisms," October 25, 1999.

[95] National Sun Yat-San University, Kaohsiung, Taiwan, "Mechatronics - Integrated Design and Control of Electro-Mechanical Systems," June 21, 1999.

[96] National Central University, Chungli, Taiwan, "Mechatronics - Integrated Design and Control of Electro-Mechanical Systems," June 19, 1999.

[97] Lutron Electronics, "Mechatronics - Integrated Design and Control of Electro-Mechanical Systems," June 22, 1998.

[98] General Motors Research Laboratories, Warren, Michigan, "Real-Time Estimation of Clutch Torque Based on Engine Torque Strut Force Measurement", August 15, 1989.

STUDENT MENTORING

PhD Degree Completed

[1] Keith A. Williams, PhD, 2001, "An Investigation of the Design and Control of Shape Memory Alloy Adaptive-Tuned Vibration Absorbers" – University of Alabama

[2] Hong Sun, PhD, 2001, "Motion Synchronization of Multi-Cylinder Electro-Hydraulic Lift Systems" – Varian Medical Systems, California

[3] Cheng-Lun Chen, PhD, 2003, "Modeling, Analysis and Robust Control for Electrophotographic Imaging Systems Subject to Spatially Periodic Disturbances and Measurable Nonlinearities" – National Chung Hsin University, Taiwan

[4] Yaoyu Li, PhD, 2004, "Adaptive-Passive Impedance Matching for Acoustic Applications" – University of Texas at Dallas

[5] Hung-Ming Cheng, PhD, 2005, "Encoding of Sampled-data Systems: Applications to Finite Wordlength Controller Implementation and Adaptive Sampling of Atomic Force Microscopy" – West Virginia University

[6] Mu-Chih Chen, PhD, 2007, "Psychophysics Study and Reduction of Banding Artifact in Secondary Colors Using an Embedded Implementation of Closed-Loop Control on Multiple Motion Systems in an Electrophotographic Process." – Indiana Research Institute, Columbus, Indiana

[7] Feng Liu, PhD, 2009, "Modeling and Control of a Two Component Development Process for Xerography" – Cummins, Indiana

[8] Moeed Mukhtar, PhD, 2009, "Repetitive Motion Error Compensation through Iterative Learning based Calibration with Application to Flatbed Document Scanners" – Corning, New York

[9] Pei-Ju Chiang, PhD, 2009, "Extrinsic Signatures Embedding and Detection in Electrophotographic Halftoned Images through Exposure Modulation" – National Chung Cheng University, Taiwan

[10] Yan-Fu Kuo, PhD, 2011, "Improving Tone Consistency and Reducing Calibration Frequency for Color Electrophotography" – National Taiwan University, Taiwan

[11] Aravind Mikkilineni, PhD, 2012, "Information Hiding in Printed Documents" – Oakridge National Laboratory, Tennessee

[12] James Mynderse, PhD, 2012, "Two Degree-of-Freedom Hysteresis Compensation for a Dynamic Mirror with Antagonistic Piezoelectric Stack Actuation," – Lawrence Technological University, Michigan

[13] Jeff Shelton, PhD, 2013, "Efficient Generation of Human-like Aiming Movement" – Purdue University, Indiana

[14] J. Will Boley, PhD, 2013, "Print Mask Design for Inkjet Functional Printing," – Boston University, Massachusetts

[15] Nikhil Bajaj, PhD, 2017, "Microresonator-based Sensors with Feedback-Enabled Nonlinearities" (with J. Rhoads) – University of Pittsburg, Pennsylvania

[16] Allison Murray, PhD, 2019, "Exploring Inkjet Printing of Functional Materials and Their Use in Energetic Systems and Sensing Applications" (with J. Rhoads) – Marquette University, Milwaukee, Wisconsin

[17] Ahmed Al Otaibi, PhD, 2021, "Polymer Nanocomposite-Based Wide Band Strain Sensor for 3d Force Measurement Using Piezoelectric and Piezoresistive Data Fusion" (with S. Anwar) – Taif University, Saudi Arabia

[18] Cih Cheng, PhD, 2022, "Drop-on-Demand Printing of Hydrogels From Subdrop Transport Phenomena to Functional Materials" (with B. Han) – Intel, Arizona

MS Degree Completed

[1] Jeff Clark, MS (non-thesis), 1998, "Design of an Automatic Roll Compensator for the SteadiCam Systems" (with Dr. P. Meckl) – Lexmark

[2] Grant Ingram, MS, 1999, "Robust Multivariable Control Systems for the Power Management of Wheel Loaders" (with Dr. M. Franchek) – General Electric

[3] Michael T. Ewe, MS, 2000, "Halftone Banding Reduction in Electrophotographic Process using Piezoelectric Laser Beam Deflection Device" – Hewlett-Packard

[4] Jaewook Ryu, MS, 2000, "Pulsed Laser Machining of Thin Films for Microsensor Development" (with Dr. X. Xu)

[5] John Reedy, MS, 2001, "Design and Control of High Performance Electro-Hydraulic Systems" (with Dr. B. Yao) – Caterpillar

[6] Mu-Chih Chen, MS (non-thesis), 2001, "Modeling of Electrophotographic Process" – Indiana Research Institute, Columbus, Indiana

[7] Robert Witman, MS, 2001, "Java Based Multi-User Interface and Remote Control for Telemicroscopy" – RiffWare LLC

[8] Ninad Shinde, MS, 2001, "Feasibility Study of the Design and Fabrication of a Mesoscaled Pulse-Tube Refrigeration System" (with Dr. R. Bashir) – Stroud Consulting

[9] Anand Deshpande, MS, 2001, "DSP Based InkJet Printing System for Dynamic Print Mode Control" – Real-Time Innovation

[10] Shivkumar Duraiswamy, MS, 2003, "Nonlinear Adaptive Nonsmooth Dynamic Surface Control of Electro-Hydraulic Systems" – GE Transportation Systems

[11] Kyle Merrill, MS, 2003, "Nonlinear Observer Based Diagnostics for Electro-Hydraulic Systems" – Dennison Hydraulics

[12] Krishna Subramanyam, MS, 2004, "An Experimental Study on the Use of Bluetooth® for Embedded Wireless Real-time Control" – Servo Tech

[13] Dana Howard, MS, 2004, "Observer Based Commutation Torque Estimation in Brushed Permanent Direct Current Motors" – NextGen Aeronautics

[14] James Mynderse, MS, 2004, "Design and Control of a Steering Wheel Vibration Simulator for Human Perception Testing" – Lawrence Technological University, Michigan

[15] Kenji Totsuka, MS, 2005, "Tone Curve Stabilization for Color Electrophotography" – Lexmark

[16] Yan-Fu Kuo, MS (non-thesis), 2005, "System Modeling and Sensitivity Analysis of Equivalent System Mass for Regenerative Solid Waste Treatment System in NASA Advances Life Support Systems" – National Taiwan University, Taiwan

[17] Joshua R. McKinsey, MS, 2006, "Interfacing a Force-Feedback Joystick with a Hydraulic Robot Arm," – Toyota, USA

[18] Benjamin Lovett, MS 2006, "Analysis and Characterization of PMDC Motor Commutation Torque Ripple" – Cummins, Indiana

[19] Nick Post, MS, 2007 "Precision Micro-Deposition of Functional Layers Using Inkjet Drop-on-Demand and Applications to the Functionalization of Microcantilever Sensors" – Stryker, Michigan

[20] Jun Cai, MS, 2007 "System Modeling and Optimal Control of Plant-Based Anaerobic-Aerobic Bioreactor Linked Operation (PAABLO) Subsystem in NASA Advanced Life Support System" – General Motors, Connecticut

[21] Alamelu Ramaswamy, MS (ECE, non-thesis), 2008, "Lamp Intensity Regulation for Document Scanners"

[22] Wei Sam Wong, MS (non-thesis), 2009

[23] Divya Varadaraj, MS (non-thesis), 2010, "Supply Chain System Modeling, Analysis and Management" – 3M

[24] Trever Owen, MSME, 2011, "Design and Control of a Hand Prosthesis"

[25] Chenchao Shou, MSME, 2013, "A Study of Inkjet Printed Line Morphology Using Volatile Ink with Non-Zero Receding Contact Angle for Conductive Trace Fabrication" - UIUC

[26] Aaron Fulton, MSME 2015, "Drop Volume Modulation via Modulated Contact Angle in Inkjet Systems"

[27] Guixiang Zhao, MSME (non-thesis), 2015, "Functional Inkjet Printer Control"

[28] Anurag Kumra, MSME, 2016 (non-thesis), "Backpressure Control for Functional Inkjet Printing" – Cummins, Indiana

[29] Wei-Tai Chen, MSME 2016 (non-thesis), "Process Monitoring and Control for Roll-to-Roll Manufacturing of Nanocellulose based Film and Laminates Thermal and Vacuum Forming"

[30] De-Wei Chang, MSME 2018 (non-thesis), "Design and Control of a Forearm Rehab Device"

In Progress

[1] Jie Wang, PhD student, "Drop Volume, Velocity, and Placement Control for Drop-on-Demand Inkjet Printers"

[2] Yumeng Wu, PhD student, "Height Control for 3D Drop-on-Demand Printing of UV Curable Ink"

[3] Andrea Felicelli, PhD Student, "Characterization and printing of Bio-Inspired Surface Heat Treatment" (with X. Ruan)

[4] Qing Wen, MS student, "Inkjet printing control"

Undergraduate Student Research

[1] Chetan Kumar, Spring 1997, "Active Control of Closed Box Subwoofer Systems"

[2] Ian Whiting, Spring 1997, "In-Situ Velocity Measurement of a Voice-Coil Actuator"

[3] Alan Fung, Fall 1997, "Real-Time Control of Closed Box Subwoofer Systems using Voice-Coil BEMF Measurement"

[4] Matthew S. Moses, Fall 1998, "Celluar Robot"

[5] Avinash Aradhya, Fall 1998, "Electro-Mechanical System Integration"

[6] Henry Fadillah, Spring 1999, "Modeling and Control of Media Advance System"

[7] Oguz Eilbol, Fall 1999, "Modeling and Control of Wire Bonding Machines"

[8] Robert Witman, Spring 2000, "Remote Control for Telemicroscopy"

[9] Alan Brockman, Spring and Fall 2001, "Design and Rapid Prototyping of the Articulating Purdue Prosthetic Hand"

[10] Julia Badger, Summer 2001, "Balancing a Rover Robot using a Solid-State Gyro Sensor"

[11] Paul Roales, Spring 2002, "Mobility and e-Printing"

[12] Kenji Totsuka, Honor's Thesis, December 2002, "Modeling and Control of an Electro-Hydraulic Manipulator"

[13] Julia Badger, Fall 2003, "pH Level Regulation for a Hydroponic Growth Chamber"

[14] Scott Holbert, Spring 2004, "Sensing Glove Interface and Control of the Articulating Purdue Prosthetic Hand"

[15] Nikhil Bajaj, Summer 2006 (SURF), "Implementation of a Multi-Spectral Camera using a Precision Piezoelectric stage"

[16] Nikhil Bajaj, Fall 2006, "Modeling of a Piezoelectric Stage for High Speed Scanning in a Multi-Spectral Camera"

[17] Andi Satiawan, Honor's Thesis, Fall 2006 and Spring 2007, "Modeling and Control of an Voice-Coil Motor Actuated Dynamic Mirror Actuator for Laser Steering"

[18] Senaka Hearth-Jayakoddy, Fall 2006 and Spring 2007, "Acoustic De-mining"

[19] Nikhil Bajaj, Summer 2007 (SURF), "Inkjet Functionalization of Micro Sensor Arrays"

[20] Samik Ghoshal, Summer 2009 (SURF), "Developing a Low Cost Single Board Microcontroller for Mechatronics Applications"

[21] Roya Akhavain, Summer 2009, "Inkjet Deposition and Patterning of Biological Material"

[22] Courtney Burke, Summer 2010, "Optimal Calibration Timing for Color Laser Printers"

[23] Ann Whitney, Spring 2011, "Piezoelectric Driven Dynamic Mirror Actuator"

[24] Ann Whitney, Summer 2011, "Piezoelectric Driven Dynamic Mirror Actuator"

[25] Jieyu Lu, Spring 2014, "Instrumentation and Control for Functional Printing"

[26] Guoxiang Zhao, Spring and Fall 2014, "Instrumentation and Control for Functional Printing"

[27] Jieyu Lu, Summer 2014 (SURF), "Anti-counterfeiting"

[28] Kaixin Zhang, Fall 2015, "Simulation of a Bandwidth-limited Real-time Control System"

[29] Kaixin Zhang, Summer 2016, "Imaging System for Functional Inkjet Printing"

[30] Anny Du, Spring 2017, "Forearm Rehabilitation Apparatus"

[31] Ahmed Khalil, Spring/Fall 2017 and Spring 2018 "Cellphone Controlled Robot and Social Network"

[32] Xinrui (Michael) Wang, Fall 2017 and Spring 2018, "Cellphone Robotics"

[33] Qing Wen, Fall 2021, "Imaging Based Control of Drop Volume and Drop Velocity"

[34] Karla M. Aleman-Alicea, Summer 2022, "Layer-to-Layer Interaction During Dehydration in Drop-on-Demand Inkjet, Printed Hydrogels"

[35] Zoya Bashir, Summer 2022, "Challenges for Sustainable and Cost-Effective Plastic Disposal in the Muzaffarabad Region of Pakistan"

Outreach and K-12 Education

- *Founding Member and Advisor, Purdue FIRST Programs*
  Advise Purdue student mentors and coordinate with K-12 school partners to inspire and raise the interest and recognition for science, engineering and technology in K-12 students. The vehicle is to organize K-12 students into multi-disciplinary teams that build robots to compete in regional and national competition, the FIRST Robotic Competition. Currently working with 4 local high schools, 30 Lego Robotics (5-8th grade) teams, and hosting Boilermaker Regional Competition as well as the Boilermaker Lego League Tournament. Total K-12 student impacted by our activities exceeds 800 per year.

TEACHING AND CURRICULUM DEVELOPMENT

Courses Taught

ME263L Introduction to Design	Spring 08
ME297F First Leadership	Fall 05, 13, Spring 11, 14, Spring and Fall 06, 07, 08, 09, 10, 15, 16, 17, 18, 19, 20, 21
ME297 ASME Design Contest	Spring 10
ME365 Measurement Systems	Fall 96, 10, 14, 15 and Spring 97, 11, 15
ME375 System Modeling and Analysis	Fall 97, 16, Spring 98, 99, 14, 16
ME463 Senior Capstone Design	Spring 04, 06, 07, 09 and Fall 09

ME475 Automatic Control Systems	Spring 03, Fall 06, 17
ME497F FIRST Robotic Advisor Leadership	Spring and Fall 02, 03, Spring 04
ME575 Theory and Design of Control Systems	Fall 18, 19, 20
ME578 Digital Control	Spring 98, 99, 2000, 01, 02, 03, 07, 08, 09
ME588 (ME597G) Mechatronics	Fall 98, 99, 2000, 01, 02, 03, 05, 21, Spring 10, 11, 17
ME597H Healthcare Product Design	Fall 07, 08
ME597P Perception-Based Engineering	Spring 09
ME597 Digital Control	Summer 10
EE495M Student Projects in Mobility	Spring and Fall 02, 03, 04, Spring 05
ME497G GEARE Global Design Project	Spring 05 (Shanghai Jiao Tong University), Fall 05, 06, 08, 09, 10 (Purdue University)
ME498 Advanced FIRST Leadership	Spring 21, 22
Digital Control	Spring 05 (Shanghai Jiao Tong University)

Curriculum Development

- *Healthcare Product Design*
  The objective of this project-oriented course is to provide guided experience in a multidisciplinary product-design team (Engineering, Management and Nursing), developing new-product ideas that address "patient needs"; i.e., one that focuses on nursing as the primary customer. The teams will develop a product/device and determine a business model based on clinical needs, market analysis, patient safety, and engineering feasibility studies. The project will emphasize problem-definition, design-conceptualization, and establish a business model.
- *Remote Laboratory*
  The laboratory facility can be accessed through e-mail exchange. This avoided the issues with corporate firewall. The facility provided the student with the flexibility of being able to perform measurement and control experiments anytime and anywhere. It was first deployed during the spring 2002 semester with the ME578 Digital Control course. Student response is exceptionally positive. The facility is currently being duplicated at the University of Michigan. It was used for the first time in Purdue Continuing Engineering Education course to incorporate laboratory and experiment experience into distance learning.
- *FIRST Leadership Course*
  Developed hand-on leadership training course for student mentors of the Purdue FIRST program (PFP). The course is designed to provide students with leadership and mentor skill through the integration of experiential learning and community service. The students practice their leadership, teamwork and mentoring skills through the day-to-day operation of the PFP and all of the programs and events that the organization sponsor and support. The course is organized as a curriculum style format with required session that are fundamental and required for all members of PFP and a set of elective session that the members and select based on their interest and responsibility of in the organization.
- *ME588* (*ME597G*) *Mechatronics*
  A new course developed with an integrated laboratory component. The project-oriented course is intended to provide student with working experience interfacing and power electronics as well as realistic product development experience. The final course project was to simulate actual product development cycle with well-defined deliverable and hard time and resource constraint. Since its first offering in Fall 1998, the course has received an average review of 4.6/5.0 and are attended to capacity, that is limited by laboratory resource constraint. The course model and material has been duplicated to many universities in the US and abroad through Purdue graduates that have taken on academic careers.

- *ME578 Digital Control*
  The course was not offered for many years due to lack of student participation. Professor Chiu completely revamped the course content and instruction format. The course notes and lecture slides are collaboratively developed with Professor H. Peng and were being used by University of Michigan and Purdue University. The course has been offered yearly with increasing enrollment and improved student evaluation. It is also offered through the Purdue distance learning channels.
- *Measurement Systems and ME375 System Dynamics*
  Developed electronic lecture notes that can be continuously updated.

SERVICE ACTIVITIES

Purdue University

- Member, Purdue Mandela Washington Fellow Program Steering Committee, 2022
- Member, USAID LASER PULSE Advisory Board, 2019-present
- Member, Global Academic Committee, 2018-present
- Member, India Working Group, 2017-present
- Member, Colombia Purdue Partnership Steering Committee, 2018-2021
- Member, PARI-GDI Executive Director Search Committee, 2021

Purdue University – College of Engineering

- Engineering Leadership Team, 2018-present
- Engineering Undergraduate Advisory Committee, 2018-present
- Purdue Engineering Transformative Experience Executive Committee, 2019-2020
- Data Science and Engineering Committee, 2017-2018
- Diversity and Inclusion Education Team, 2017
- Global Engineering Program Council, 2014-2017
- Global Engineering Program Team, 2009–2011
- Perception-based Engineering (PBE) Signature Area Co-Chair, 2009–2011
- Perception-based Engineering (PBE) Faculty Search Committee Co-Chair, 2009–2011
- CoE Strategic Plan Execution Team, 2009–2010
- Global Engineering Program Director Search Committee, 2007–2008
- P-16 Outreach Coordinator Search Committee, 2007–2008
- ICPT Signature Area Search Committee, 2003–2006
- CoE Dean Search Committee, 2000–2001
- Caterpillar/Purdue/MSOE Electro-Hydraulic Education Committee, 1998–2002

Purdue University – School of Mechanical Engineering

- ME Taskforce on Equality, Anti-Racism, and Inclusion, 2020-present
- ME Primary Committee, 2005–present
- Chair, Faculty Recruit Evaluation Committee, 2020-2021
- Chair, ME Global Studies and Engagement Committee, 2014-2017
- ME Leadership Team, 2008–2011, 2014-2017
- School Impact and Reputation Ad-hoc Committee, 2014

- Faculty Search Committee, member, 2013–2015
- Systems, Measurements and Control (SMAC) Area Chair, 2010–2011
- Facilities Planning and Space Management Committee, 2010–2011
- Spira Lab Faculty Committee Chair, 2000–2011
- Instructional Lab Committee, 1998–2011
- Graduate Committee, 2005–2009
- Internal Academic Review Committee, 2004–2005
- Strategic Faculty Search Committee, 2002–2007
- Mechanical Systems Faculty Search Committee, 2002–2003
- Herrick Lab Academic Planning Committee, 2000–2001
- Ad Hoc Committee on Teaching Load, 1999
- Herrick Lab Shop Staff Search Committee, 1998–1999
- Feddersen Chair Professor Search Committee, 1998–2002

Professional Societies and Activities

- Fellow of the American Society of Mechanical Engineers (ASME)
- Fellow of the Society for Imaging Science and Technology (IS&T)
- Senior Member of Institute of Electrical and Electronic Engineers (IEEE)
- Member, American Automatic Control Council, Technical Meeting Committee, 2022-present
- Member, ASME Dynamic Systems and Control Division, Honors and Awards Committee, 2019-present
- Member, International Federation of Automatic Control (IFAC) Technical Committee on Mechatronic Systems, 2005-present
- Member, Board of Directors, American Automatic Control Counsel, 2018-2020
- Member, Nominating Committee, American Automatic Control Counsel, 2016-2018
- Past Chair, ASME Dynamic Systems and Control Division, 2014-2015
- Chair, Executive Committee, ASME Dynamic Systems and Control Division, 2013-2014
- Vice Chair, Executive Committee, ASME Dynamic Systems and Control Division, 2012-2013
- Member, Executive Committee, ASME Dynamic Systems and Control Division, 2010-2012
- Chair, Management Committee, *IEEE/ASME Transactions on Mechatronics*, 2011
- Member, Management Committee, *IEEE/ASME Transactions on Mechatronics*, 2010
- Secretary, ASME Dynamic Systems and Control Division, 2007-2010
- Conference Committee Chair, Mechatronics Technical Committee, ASME Dynamic Systems and Control Division, 2006-2008
- Chair, Adaptive and Optimal Control Technical Panel, ASME Dynamic Systems and Control Division, 2002-2004
- National Committee for Information Technology Standards (NCITS)
  - W1.1 Workgroup – Image Quality for Printers, 2001-2003
- Vice-Chair, Adaptive and Optimal Control Technical Panel, ASME Dynamic Systems and Control Division, 2000-2002

Journal and Publication Editorship

- Editor-in-Chief, *IEEE/ASME Transactions on Mechatronics*, 2017-2019
- Member, Editorial Board, *Chinese Journal of Mechanical Engineering*, 2013-2015
- Editor, *Journal of Imaging Science and Technology*, 2012-2014
- Associate Editor, *Journal of Control Engineering Practice*, 2007-2013
- Member, Editorial Board, *Frontiers of Mechanical Engineering*, 2008-2011
- Associate Editor, *Journal of Electronic Imaging*, 2005-2011
- Associate Editor, *ASME Journal of Dynamic Systems, Measurement and Control*, 2004-2009
- Member, Editorial Board, *Microsystem Technologies – Micro- and Nanosystems. Information Storage and Processing Systems*, 2002-2008
- Guest Editor, Focused Sections on Healthcare Mechatronics, *IEEE/ASME Transactions on Mechatronics*, April 2010

Conference Organization

- Member, Advisory Committee, IFAC Modeling, Estimation and Control Conference, 2020-present
- General Chair, The 24th Annual Colloquium on International Engineering Education (ACIEE), 2021
- General Chair, The 2021 American Control Conference, New Orleans, Louisiana, May 2021
- Program Chair, The 2016 American Control Conference, Boston, Massachusetts, June 2016
- Member, Program Committee, 2015 IEEE Multi-conference on Systems and Control, Sydney, Australia, September 2015
- Member, Organized Session Committee, 2015 IEEE/ASME International Conference on Advanced Intelligent Mechatronics, Busan, South Korea, July 2015
- Registration Chair, The 2012 American Control Conference, Montreal, Canada, June 2012
- Finance Chair, The 2011 American Control Conference, San Francisco, California, June 2011
- Member, Program Committee, The 49th IEEE Conference on Decision and Control (CDC10), Atlanta, Georgia, November 2010
- Publication Chair, The 2010 Dynamic Systems and Control Conference (DSCC10), Boston, Massachusetts, October 2010
- Publication Chair, The 2010 IFAC Symposium on Mechatronic Systems, Boston, Massachusetts, October 2010
- Program Chair, The 2010 IEEE/ASME International Conference on Advanced Intelligent Mechatronics (AIM'10), Montreal, Canada, July 2010
- Publicity Chair, The 2009 ASME Dynamic Systems and Control Conference (DSCC09), Los Angeles, California, October 2009
- Program Chair – Special Papers, The 25th International Conference on Digital Printing Technologies, Louisville, Kentucky, September 2009
- Program Co-Chair, The 2009 IEEE/ASME International Conference on Advanced Intelligent Mechatronics (AIM'09), Singapore, July 2009
- Publicity Chair, The 2008 ASME Dynamic Systems and Control Conference (DSCC08), Ann Arbor, Michigan, October 2008
- Panel Moderator, "Environmental and Reliability Challenges for Electrophotographic and Ink Jet Printing," The 24th International Conference on Digital Printing Technologies, Pittsburg, Pennsylvania, September 10, 2008.

- Organizing Co-Chair, The 2008 IEEE International Conference on Automation and Logistics, Qingdao, China, September 2008
- Member, Organizing Committee, The 2007 International Automatic Control Conference (CACS2007), Taichung, Taiwan, November 2007
- Member, International Program Committee, The 2007 International Conference on Advanced Intelligent Mechatronics (AIM'07), Zurich, Switzerland, September 2007
- Member, International Program Committee, The 4th International Federation of Automatic Control (IFAC) Symposium on Mechatronic Systems, Heidelberg, Germany, September 2006
- Member, Program Committee, The 2006 International Symposium on Flexible Automation, Osaka, Japan, July 10-12, 2006
- Member, Organizing Committee, The 16th Joint ASME Symposium on Information Storage and Processing Systems and the JSME MIPE, Santa Clara, California, June 2006
- Member (ASME Representative), Program Committee, The 2006 American Control Conference, Minneapolis, Minnesota, June 2006
- Workshop/Tutorial Chair, The 2005 IEEE/ASME International Conference on Advanced Intelligent Mechatronics (AIM'05), Monterey, California, July 2005
- Member, International Program Committee, The 3rd International Federation of Automatic Control (IFAC) Symposium on Mechatronic Systems, Manly, Australia, September 2004
- Member, Organizing Committee, The 14th ASME Annual Symposium on Information Storage and Processing Systems, Santa Clara, California, June 2004
- Member, Program Committee, The 2004 American Control Conference, Boston, Massachusetts, June 2004
- Member, Program Committee, The 2003 IEEE/ASME International Conference on Advanced Intelligent Mechatronics (AIM'03), Kobe, Japan, July 2003
- Member, International Program Committee, The 2nd International Federation of Automatic Control (IFAC) Symposium on Mechatronic Systems, Berkeley, California, December 2002
- Member, Technical Committee, The 2002 IEEE International Symposium on Industrial Electronics (ISIE 2002), L'Aquila, Italy, 2002
- Member, Organizing Committee, The 13th Annual Symposium on Information Storage and Processing Systems, Santa Clara, California, June 2002
- Member, Program Committee, The 2001 IEEE/ASME International Conference on Advanced Intelligent Mechatronics (AIM'01), Como, Italy, July 2001
- Member, Organizing Committee, The 12th Annual Symposium on Information Storage and Processing Systems, Santa Clara, California, June 2001
- Session Organizer/Chair for:
  - Session Chair, "Identification," 2022 American Control Conference, June 2022
  - Session Chair, "Estimation and Identification," 2016 ASME Dynamic Systems and Control Conference, October 2016
  - Session Chair, "Mechatronics," 2015 ASME Dynamic Systems and Control Conference, October 2015
  - Session Chair, "Control of Mechatronic Systems," 2014 ASME Dynamic Systems and Control Conference, October 2014
  - Session Chair, "Sensors and Sensing Systems," 2013 IEEE/ASME International Conference on Advanced Intelligent Mechatronics, July 2013

- Session Co-Chair, "Modeling and Design of Mechatronic Systems 2," 2012 IEEE/ASME International Conference on Advanced Intelligent Mechatronics, July 2012
- Session Chair, "Modeling and Simulation," 2011 ASME Dynamic Systems and Control Conference, October-November 2011
- Session Co-Chair, "Microelectromechanical Systems (MEMS)," 2010 ASME Dynamic Systems and Control Conference, September 2010
- Session Chair, "Modeling and Design of Mechatronic Systems III," 2009 IEEE/ASME International Conference on Advanced Intelligent Mechatronics, July 2009
- Session Organizer/Chair, "Imaging and Printing Technologies," 2009 JSME/ASME Joint Conference on Micromechatronics for Information and Precision Equipment (MIPE), June 2009
- Session Chair, "Optimal and LPV Control," 2008 ASME Dynamic Systems and Control Conference, Ann Arbor, Michigan, October 2008
- Session Chair, "Human Motion Modeling and Control," 2008 ASME Dynamic Systems and Control Conference, Ann Arbor, Michigan, October 2008
- US Chair, "Printing Systems Engineering and Optimization," NIP24: International Conference on Digital Printing Technologies, Pittsburg, Pennsylvania, September 2008
- Session Chair, "Applications of Nonlinear Control – II," 2008 IFAC World Congress, Seoul, South Korea, July 2008
- Session Chair, "Nonlinear and Adaptive Control I," 2008 IEEE/ASME International Conference on Advanced Intelligent Mechatronics, Xian, China, July 2008
- Topic Organizer, "Mechatronics," 2007 ASME International Mechanical Engineering Congress and Exposition, Seattle, Washington, November 2007
- US Chair, "Printing Systems Engineering and Optimization," NIP23: International Conference on Digital Printing Technologies, September 2007
- Session Chair, "Robust Control and Applications," 2007 American Control Conference, July 2007
- Session Chair, "Metrology and Control," 2007 International Conference on Integration and Commercialization of Micro and Nanosystems, Sanya, China, January 2007
- Topic Organizer, "Mechatronics," 2006 ASME International Mechanical Engineering Congress and Exposition, Chicago, Illinois, November 2006
- US Chair, "Printing Systems Engineering/Optimization," NIP22: International Conference on Digital Printing Technologies, September 17-22, 2006
- Chair, "Digital Filtering and Embedded Control," the 4th IFAC-Symposium on Mechatronic Systems, Heidelberg, Germany, September 12-14, 2006
- Co-Chair, "Innovative Production Systems and Control," 2006 International Symposium on Flexible Automation, Osaka, Japan, July 10-12, 2006
- Co-organizer/Co-Chair, "Image Construction Technology," 2006 ASME/JSME Joint Conference on Micromechatronics for Information and Precision Equipment, Santa Clara, California, June 21-23, 2006
- Co-Chair, "Modeling for Emerging Applications," 2006 American Control Conference, Minneapolis, Minnesota, June 14-16, 2006
- Co-Chair, "Control of Mechatronic Systems," The 3rd IFAC Symposium on Mechatronic Systems, Sydney, Australia, September 2004
- Organizer/Chair, "Sensing, Modeling and Control of Xerography," 2004 American Control Conference, Boston, Massachusetts, July 2004
- Chair, "Control Applications," 2003 IEEE International Conference on Robotics and Automation, Taipei, Taiwan, September 2003
- Chair, "Adaptive Control for Electro-Mechanical Systems," 2003 American Control Conference, Denver, Colorado, June 2003

- Chair, “Vision Systems,”2nd IFAC Conference on Mechatronic Systems, Berkeley, California, December 2002
- Chair, “Motion Control,”2nd IFAC Conference on Mechatronic Systems, Berkeley, California, December 2002
- Chair, “Nonlinear Control,”2nd IFAC Conference on Mechatronic Systems, Berkeley, California, December 2002
- Organizer/Chair, “Symposium on the Theory and Applications of Adaptive and Optimal Control,” 2002 ASME International Mechanical Engineering Congress and Exposition, New Orleans, Louisiana, November 2002
- Chair, "Electric Motors and Electronics," the 16th International Compressor Engineering and the 9th International Refrigeration and Air Conditioning Conferences, West Lafayette, Indiana, July 2002
- Chair, "Control Applications III," 2002 American Control Conference, Anchorage, Alaska, May 2002
- Organizer/Chair, "Identification of Mechanical Systems," 2001 ASME International Mechanical Engineering Congress and Exposition, New York, New York, November 2001
- Organizer/Chair, "Advance in Adaptive and Optimal Control," 2001 ASME International Mechanical Engineering Congress and Exposition, New York, New York, November 2001
- Chair, "Software Design for Manufacturing," 2001 IEEE/ASME International Conference on Advanced Intelligent Mechatronics (AIM '01), Como, Italy, July 2001
- Organizer/Chair, "Motion and Imaging," 2001 IEEE/ASME International Conference on Advanced Intelligent Mechatronics (AIM '01), Como, Italy, July 2001
- Organizer/Chair, "Motion and Imaging," 2000 ASME International Mechanical Engineering Congress and Exposition, Orlando, Florida, November 2000
- Organizer/Chair, "Recent Advances in Adaptive and Optimal Control," 2000 ASME International Mechanical Engineering Congress and Exposition, Orlando, Florida, November 2000
- Organizer/Chair, "Control of Electro-Mechanical Systems," 2000 American Control Conference, Chicago, June 2000
- Chair, "Intelligent Systems Applications," 2000 American Control Conference, Chicago, June 2000
- Organizer/Chair, "Coordinated Control," 1999 American Control Conference, San Diego, June 1999
- Co-Chair, "Historical Perspective, Landmark Results, and Future Research Directions in Robust Control," 1998 ASME International Mechanical Engineering Congress and Exposition, Anaheim, November 1998
- Co-Chair, "Flexible Media Mechanics," 1998 ASME International Mechanical Engineering Congress and Exposition, Anaheim, November 1998
- Organizer/Chair, "Coordinated Control," 1998 American Control Conference, Philadelphia, June 1998
- Organizer/Chair, "Control of Electro-Hydraulic Systems," 1998 American Control Conference, Philadelphia, June 24 – 26, 1998
- Co-Chair, "Design and Control of Smart Machines," 1997 ASME International Mechanical Engineering Congress and Exposition, Dallas, November 1997

- Reviewer for:
  - Hong Kong Research Grant Council, Theme-based Research Scheme Selection Panel, member, 2021-present
  - Hong Kong Research Grant Council, Engineering Subpanel, member, 2016-2021

- Rutgers University, AI Institute External Review Panel, 2020
- Hong Kong University of Science and Technology, Central Research Facility Review Panel, Chair, 2018
- University of Cincinnati, Mechanical Engineering Graduate Program, External reviewer, 2017
- Hong Kong Innovation and Technology Council, Partner State Key Lab Review Panel, 2017
- SUNY Plattsburgh, Robotics Program, External reviewer, 2017
- Oklahoma State University, Mechanical and Aerospace Engineering, External reviewer, 2016
- National Science Foundation
- Canadian Council for the Arts
- ASME Journal of Dynamic Systems, Measurement and Control
- ASME Journal of Manufacturing Science and Engineering
- IEEE/ASME Transactions on Mechatronics
- IEEE Transactions on Automatic Control
- IEEE Transactions on Control Systems Technology
- IFAC Journal on Mechatronics
- IFAC Journal of Control Engineering Practice
- IEEE Transactions on Education
- IEEE Control Systems Magazine
- Journal of Sound and Vibration
- Journal of Electronic Imaging
- Microsystem Technologies – Micro- and Nanosystems and Information Storage and Processing Systems
- Automatica
- European Journal of Control
- International Journal on Optimal Control and Applications
- U.S. Civilian Research & Development Foundation
- Various national and international conferences in control and mechatronics
- Prentice-Hall, McGraw-Hill, and PWS Publishing Company

SHORT COURSES

[1] "Topics on Robust Control," – Harbin Institute of Technology, March 28-31, 2011

[2] "Modeling and Control of Digital Imaging and Printing Systems," – Harbin Institute of Technology, June 23-25, 2009

[3] "Topics on Digital Control," – Zhejiang University, November 10-19, 2008

[4] "Digital Control and Applications for Mechatronic Systems" – Japan-USA-Vietnam RESCCE 2002 Summer School

[5] "Automatic Control" – Herrick Laboratories Partners Program Short Course (with M. Franchek)

[6] "Basic Controls" – Caterpillar Electrohydraulic Curriculum

[7] "Fundamentals of Microprocessor Control" – Herrick Laboratory Short Course (with P. Meckl)

CONSULTING

Willkie Farr & Gallagher LLP; General Vibration LLC; Bracewell LLP; Stryker; Fitzpatrick, Cella, Harper & Scintos LLP; Shuttleworth Inc.; SiPix Inc.; Indiana University; Ingersoll-Rand; Caterpillar; Unisys; Texas Instruments; and The Applied Group

SPONSORS

Hewlett-Packard, Samsung Electronics, Rotary Lift, Caterpillar, Lexmark, Nucor-Castrip, Ford Foundation, Bill and Melinda Gates Foundation, Xerox Corporation, Texas Instruments, Polaris Corporation, Sunvalleytek, Google, Lord Corporation, Trane, AT&T Foundation, American University of the Middle East, IEEE, Electrical Manufacturing and Coil Winding Association, e-Enterprise Center in the Purdue Discovery Park, Purdue Research Foundation, Purdue Institute for Drug Discovery, State of Indiana, Army Research Laboratory, US Department of Agriculture, Defense Threat Reduction Agency, US Department of Energy, US Department of Homeland Security, NASA, and National Science Foundation

RESEARCH AND CURRICULUM GRANTS AND CONTRACTS

Total GC Share: $ 8.8M with $2.0M (as PI) + $ 6.9M (as Co-PI)
Total involved: 102 grants/contracts more than $144 million.

[1] N. Jain (PI) and G. Chiu (Co-PI), "Determining Optimal Decision-Making Sequence for Castrip Startup Process," Castrip LLC, 5/2019-8/2023, $214,815 ($429,630)

[2] D. Gan (PI), Co-PI's: G. Voyles and G. Chiu, "Discrete Variable Stiffness Actuators with Fast Stiffness Switch for Safe Human-Robot Interaction," National Science Foundation, 9/2021-8/2024, $149,468 ($555,908)

[3] J.H. Choi (PI), Co-PI's: B. Han, G. Chiu, K. Soloman, "FMSG: Bio: Microbial Foundry for Distributed Manufacturing of mRNA-Containing Biomaterials," National Science Foundation, 09/2021-08/2023, $113,750 ($500,000)

[4] G. Chiu (PI), "Visiting Scientists Appointment – Yumeng Wu," Xerox Corp, 8/2021-7/2022, $60,000

[5] J. Rhoads (PI) and Co-PI's: G. Chiu and S. Son, "ARMY CA: Task 11," Army Research Lab, 08/2020-07/2023, $265,244 ($795,732)

[6] G. Chiu (PI) and Co-PI's: J. Rhoads, B. Boudouris, and J. Braun, "Multi-sensor Platform Integration for Volatile Organic Compound (VOC) Specie and Location Classification," Center for High Performance Buildings, Purdue University, 1/2021-12/2021, $70,000

[7] S. Dyke(PI),et al, "Resilient ExtraTerrestrial Habitats," NASA, 9/2019-8/2024

[8] R. Voyles (PI), Co-PI's: G. Chiu, S. Donkin, B-C. Min, and S. Sundaram, "CPS: Medium: Collaborative Research: Closed Loop Sustainable Precision Animal Agriculture," USDA/NIFA, 9/2018-8/2022, $16,834

[9] A. Raman (PI), et al. "LASER Partner for University-Led Solution Engine," USAID, 8/2018-7/2023, $72,000 ($70,000,000)

[10] J. Rhoads (PI), B. J. Braun, B. Boudouris, and G. Chiu, "Building-Integrated Microscale Sensors for CO_2-Level Monitoring," ARPA-E, Department of Energy, 5/2018-1/2022, $383,352 ($1,533,407)

[11] J.P. Allebach (PI) and G. Chiu, "Development of an Automatic Nail Printer," Sunvalleytek, 1/2018-3/2021, $165,000 ($330,000)

[12] J.P. Allebach (PI) and Co-PIs: G. Chiu, S. Bolton, and P. Davies, "Printer Diagnostic," Hewlett-Packard Company, 09/2016-09/2021, $444,996

[13] B. Han (PI), T. Siegmund, and G. Chiu, "Collapsible Basket Array for High Throughput Histology Analysis of 3D Organoids/Spheroids," Trask Innovation Fund, 1/2020-12/2020, $11,528 ($34,585)

[14] G. Chiu (PI), "IEEE Transactions on Mechatronics Editorial Service Agreement," IEEE, 10/2016-12/2019, $105,000

[15] N. Jain (PI) and G. Chiu (Co-PI), "Advanced Control of Castrip LLC Twin-Roll Casting Process," Castrip LLC, 8/2015-5/2020, $250,000 ($504,634)

[16] B. Han (PI), T. Li, Y. Yoon, and G. Chiu, "Precision Pharmaceutics for Precision Medicines," Purdue Institute for Drug Discovery, 10/2018-9/2020, $10,000 ($50,000)

[17] B. Han (PI), T. Siegmund, and G. Chiu, "Collapsible Basket Array and Flexible Strainer Insert," Leidos Biomedical Research, Inc., 5/2018-9/2018, $55,000 ($308,852)

[18] A. Bajaj (PI), J. Jones, and G. Chiu, "Core Curriculum Development and Laboratory Support for the AUM Mechanical Engineering Program," American University of the Middle East, 2/2018-5/2021, $700,000 ($2,167,154)

[19] L. Stanciu (PI) and Co-PIs: G. Chiu, J. Allebach, and A. Deering, "Develop Inkjet Surface-Functionalized Printing Technologies for Producing Antibody-based and Oligonucleotide-based Test Strips for Detecting *E. coli* O157:H7 and Other Foodborne Pathogens," Center for Food Safety Engineering, US Department of Agriculture, 4/2017-9/2020, $180,000 ($450,000)

[20] J. Youngblood (PI), P. Zavattieri, G. Chiu (Co-PI), and A. Wei, "SNM: Roll-to-Roll Manufacturing of Films and Laminates Based on Cellulose Nanomaterials," National Science Foundation, 1449358, 11/2014-10/2020, $369,492.50 ($1,477,970)

[21] J. Linnes (PI) and G. Chiu (Co-PI), "Ultra-Low-Cost Paper-Based Nucleic Acid Diagnostic Platform," Bill and Melinda Gates Foundation, 7/2016-4/2018, $15,000 ($100,000)

[22] J. Rhoads (PI), G. Chiu (Co-PI) and S. Son, "Secure MEMS: Fundamental Research in MEMS/Energetic Material Integration," Defense Threat Reduction Agency (DTRA), 11/2014-10/2017, $349,565.86 ($1,048,697.58)

[23] A Bajaj (PI), P. Davies, N. Key, J. Jones, and G. Chiu, "A Pre-college Engagement Program to Increase Minority Students Entering Mechanical Engineering," Purdue University, 1/1/2016-12/31/2017, $150,000

[24] J.P. Allebach (PI) and Co-PIs: G. Chiu, S. Bolton, and P. Davies, "Printer Diagnostic," Hewlett-Packard Company, 09/2015-08/2016, $75,000

[25] J.P. Allebach (PI) and G. Chiu (Co-PI), "Halftoning Algorithms for HP Barcelona Products," Hewlett-Packard Company, 04/2015-03/2016, $10,200 ($75,937)

[26] A. Bajaj, J. Jones, P. Davis, N. Key and G. Chiu, "Transforming Engineering Culture to Advance Inclusion and Diversity (TECAID) Program," National Science Foundation, 03/2015-09/2016

[27] J. Rhoads (PI) and G.T.-C. Chiu (Co-PI), "Portable, Integrated Microscale Sensors (PIMS) for Explosives Detection," Department of Homeland Security, 10/2013-9/2016, $107,875 ($216,250)

[28] J. Rhoads (PI), S. Bolton and G.T.-C. Chiu (Co-PI), "Leviathan," Google, 6/2014-9/2014, $28,402 ($85,206)

[29] J. Rhoads (PI), S. Bolton and G.T.-C. Chiu (Co-PI), "Model-Enabled Predictive Design of Small-Scale Electrostatic Loud Speakers," Google, 5/2014-6/2014, $11,321 ($33,963)

[30] G. Chiu (PI), "NSF IPA Assignment," National Science Foundation, 105458, 9/2013-1/2014, $42,611

[31] G. Chiu (PI) and J.P. Allebach, "Media Project," Lexmark International, Sponsor Award No.: PSA #MA-00657-LXK-2011, 9/12/2012-9/11/2013, $67,067, ($85,000)

[32] G. Chiu (PI), "NSF IP Assignment," National Science Foundation, 105458, 9/2012-9/2013, $203,458

[33] G. Chiu (PI) and J.P. Allebach, "Media Project," Lexmark International, Sponsor Award No.: PSA #MA-00657-LXK-2011, 9/12/2011-9/11/2012, $65,826, ($85,000)

[34] J.P. Allebach (PI) and G. Chiu, "Image Quality Investigation," Lexmark International, Sponsor Award No.: PSA #MA-00657-LXK-2011, 9/12/2011-9/11/2012, $19,000, ($85,000)

[35] G. Chiu (PI), "NSF IPA Assignment," National Science Foundation, 105458, 9/2011-9/2012, $195,989

[36] J.P. Allebach (PI), C. Bouman, G. Chiu, and Y. Yih, "Print Quality Improvement Program," Hewlett-Packard Company, SPO Award. No. PO# SBB430765, 2010-2011, $32,702, ($600,000).

[37] G. Chiu (PI), "Indiana Workforce Development Grant – Harrison High School," Indiana Department of Workforce Development, 2010, $4,000

[38] G. Chiu (PI), O. Ersoy, and K. Kokini, "Program and Course Development with Boğaziçi University in Turkey," International Programs, Purdue University, November 2009, $7,000

[39] J.P. Allebach (PI), C. Bouman, G. Chiu, and Y. Yih, "Print Quality Improvement Program," Hewlett-Packard Company, Purdue Acct. No. 670-1285-4024, 2009-2010, $30,702.73, ($375,000).

[40] G. Chiu (PI), "Frontiers of Control Workshop," National Science Foundation, 2009-2012, $49,999.

[41] G. Chiu (PI), "Post Cylinder Dynamic Mirror Actuator (DMA) for the Indigo Digital Press," Hewlett-Packard Company, Purdue Acct. No. 8000026883, 2009, $41,250.

[42] G. Chiu (PI), "Indiana Workforce Development Grant – Harrison High School," Indiana Department of Workforce Development, 2009, $10,000

[43] G. Chiu (PI), "Indiana Workforce Development Grant – Huntington High School," Indiana Department of Workforce Development, 2008, $5000

[44] J.P Allebach and G. Chiu (PI), "Post Cylinder Dynamic Mirror Actuator (DMA) for the Indigo Digital Press," Hewlett-Packard Company, Purdue Acct. No. 8000022624, 2008, $55,000.

[45] J.P. Allebach (PI), C. Bouman, G. Chiu, Z. Pizlo, I. Pollak, and Y. Yih, "Print Quality Improvement Program," Hewlett-Packard Company, Purdue Acct. No. 670-1285-4024, 2008-2009, $47,253, ($659,620).

[46] G. Chiu (PI), P. Davies, G. Francis, Z. Pizlo, R. Proctor, H. Tan, "Perception-based Engineering (PBE) Research Community," College of Engineering, Purdue University, 2008, $25,000

[47] G. Chiu (PI), "Indiana Workforce Development Grant – Harrison High School," Indiana Department of Workforce Development, 2007, $3000

[48] J.P. Allebach (PI), G. Chiu, Y. Yih, "*HP Boise Site Extended Visits*," Hewlett-Packard Company, P.O. No. SBY418486, 2007, voluntary support, $10,300, ($30,902).

[49] G. Chiu (PI), "Indiana Workforce Development Grant – Huntington High School," Indiana Department of Workforce Development, 2007, $7000

[50] J.P. Allebach (PI), C. Bouman, G. Chiu, Z. Pizlo, I. Pollak, and Y. Yih, "Print Quality Improvement Program," Hewlett-Packard Company, Purdue Acct. No. 670-1285-4024, 2007-2008, $61,475, ($825,000).

[51] C. Bouman (PI), G. Chiu, and J.P. Allebach, "*Next Generation Image Capture to Improve Copy Quality – a Two Phase Approach*," Samsung Electronics, Award No. 1320067836, 2006-2007, $143,940.64, ($313,662)

[52] G. Chiu (PI), "*Commutation Torque Ripple Compensation using Angular Displacement Based Repetitive Control*," Hewlett-Packard Company, Award No. 1320067828, 2006-2007, $70,339

[53] G. Chiu (PI) and H. Tan, "*Human Response to Motorcycle Handlebar Vibration,*" Polaris Industry, Award No. 2006-13-4265, 2006, $14,077, ($24,998)

[54] G. Chiu, "*Purdue FIRST Programs*," Indiana Space Grant Consortium, 2006-2007, $6000.

[55] J.P. Allebach (PI), C. Bouman, G. Chiu, Z. Pizlo, I. Pollak, and Y. Yih, "*Print Quality Improvement Program*," Hewlett-Packard Company, Award No. ERP-20005-1, 2006-2007, $133,180, ($825,000)

[56] G. Chiu, "*Purdue FIRST Programs*," Indiana Space Grant Consortium, 2005-2006, $6000.

[57] J.P. Allebach (PI), E. Delp, and G. Chiu, "*CT-ISG: Printer and Sensor Forensics*," National Science Foundation, Award No. 0524540-CCR, 2005-2008, $133,333 ($400,000)

[58] J. Allebach (PI), C. Bouman, G. Chiu, and Z. Pizlo, "*Print Quality Improvement Program*," Hewlett-Packard Company, Award. No. ERP-20005-1, 2005-2006, $116,792, ($542,160).

[59] J. Allebach (PI), G. Chiu, M. Lehto, and Y. Yih, "*Remote Print Defect Diagnosis*," Hewlett-Packard Company, Award. No. 1119990233, 2005-2006, $58,858, ($439,846).

[60] G. Chiu, "*Research in Xerographic Process Control,*" Xerox Foundation, 2004, $20,000.

[61] G. Chiu, "*Institute for Nanoelectronics and Computing,*" NASA, Award No. NCC 2-1363, 2004, $7,596.99.

[62] M. A. Sozen, A. H. Sameh, A. Grama, C. Hoffmann, and G. T. Chiu, "*SGER: Towards Real-Time Sensing and Control of Active Structures*," National Science Foundation, Award No. 0443148-CMS, 2004-2007, $62,203, ($200,000).

[63] J, Allebach and G. Chiu, "*Reduction of Banding Artifact in Electrophotographic Process Printers*," Samsung Electronics, Award No. 1320046980, 2004-2005, $69,103, ($142,181).

[64] G. Chiu, "*Purdue FIRST Programs*," Indiana Space Grant Consortium, 2004-2005, $6000.

[65] J. Allebach (PI), C. Bouman, G. Chiu, and Z. Pizlo, "*Print Quality Improvement Program*," Hewlett-Packard Company, Award. No. 1320046809, 2004-2005, $112,415, ($542,160).

[66] J. Allebach (PI), G. Chiu, M. Lehto, and Y. Yih, "*Remote Print Defect Diagnosis*," Hewlett-Packard Company, Award. No. 1119990233, 2004, $56,793, ($420,216).

[67] G. Chiu, "*Research in Xerographic Process Control,*" Xerox Foundation, 2003, $20,000.

[68] J. Allebach (PI), G. Chiu, E. Delp, J. Krogmeier, C. Rosenberg, and L. Slivovsky, "*Mobile Communications Projects*," Hewlett-Packard, Voluntary Support, Gift No. 89606.1, 3-17-03, $61,207 equipment.

[69] J. Allebach (PI), G. Chiu, E. Delp, J. Krogmeier, C. Rosenberg, and L. Slivovsky, "*Mobile Communications Projects*," Hewlett-Packard, Voluntary Support, Gift No. 89606.2, 3-17-03, $10,500 cash.

[70] J. Allebach (PI), C. Bouman, G. Chiu, and Z. Pizlo, "*Print Quality Improvement Program*," Hewlett-Packard Company, Award. No. ERP-20005-1, 2003-2004, $100,198, ($499,999)

[71] J. Allebach (PI), G. Chiu, M. Lehto, and Y. Yih, "*Remote Print Defect Diagnosis*," Hewlett-Packard Company, Award. No. 1119990233, 2003, $50,274, ($279,413).

[72] G. Chiu, "*Commutation Torque Estimation for Permanent Magnet DC Motors*," Hewlett-Packard Company, Award No. 670-6388, 2003, $74,713.

[73] J.P. Allebach (PI), E. Delp, and G. Chiu, "*ITR: Printer Characterization and Signature Embedding for Security and Forensic Applications*," National Science Foundation, Award No. 0219893-CCR, 2002-2005, $122,525 ($410,000)

[74] G. Chiu, "*Research in Xerographic Process Control,*" Xerox Foundation, 2002, $20,000.

[75] G. Chiu, "*Collaborative Research: Sensing and Control of Digital Color Xerographic Imaging Systems,*" National Science Foundation, Award No. CMS-0201837, 2002-2005, $173,737.

[76] Y. Yih (PI), G. T.-C. Chiu, and S. Orcun, "*An Integrated Advanced Life Support Collaborative Development Environment*," E-Enterprise Center in Discovery Park, Award No. 671-1213-4178, 2002-2003, $10,000, ($30,000)

[77] J. P. Allebach (PI), M. Atallah, C. Bouman, G. Chiu, E. Coyle, E. Delp, L. Jamieson, J. Krogmeier, and C. Rosenberg, "*A Proposal to Establish a Curriculum in Mobile Communications Projects at Purdue University*," Hewlett-Packard, Voluntary Support, Gift No. 87881.1, 3-14-02, $88,044 equipment.

[78] J. P. Allebach (PI), M. Atallah, C. Bouman, G. Chiu, E. Coyle, E. Delp, L. Jamieson, J. Krogmeier, and C. Rosenberg, "*A Proposal to Establish a Curriculum in Mobile Communications Projects at Purdue University*," Hewlett-Packard, Voluntary Support, Gift No. 87881.2, 5-23-02, $ 31,816.

[79] G. Chiu and B. Yao (Co-PIs in Systems Analysis), "*NASA Specialized Center of Research and Training*(*NSCORT*) *for Advanced Life Support,*" NASA, 2002-2007, $320,000 ($10,000,000), 24 Co-PIs from Purdue University, Alabama A&M University and Howard University lead by C. Mitchell (HORT), K. Banks (CE) and J. Alleman (CE).

[80] G. Chiu (PI), P. Davies, Z. Pizlo, and H. Tan, "*Vibration Quality,*" Ford Foundation, 2002-2004, $80,000 ($100,000).

[81] J. Allebach (PI), C. Bouman, G. Chiu, and Z. Pizlo, "*Print Quality Improvement,*" Hewlett-Packard Company, Award No. ERP-20005-1, 2002-2003, $97,079 ($360,000 (approximate))

[82] M. Franchek (PI) and G. Chiu, "*Nonlinear Model Based Information Synthesis and Health Detection with Applications to Drive-by-Wire Engines*," National Science Foundation, 2001-2004, $100,000 ($200,000)

[83] G. Chiu (Co-PI in Image Perception), "*Perception-Based Engineering Laboratory,*" Ford Foundation, 2001-2005, $3,500,000. Co-PIs from ME, ECE, AUS, and Psychological Science at Purdue collaborated with D. Hirleman (Head, ME), Bob Bernhard (Directory, Herrick Lab), Shari Rodriguez (ME Development), and Patricia Davis (ME, Lead-PI) on the proposal. The funds will be used to construct new facility and purchase state-of-the-art research equipment.

[84] G. Chiu, "*Nonlinear Observer Design for Cost Effective and Reliable Control of Electro-Hydraulic Systems,*" Caterpillar Inc., Award No. 1320000037, 2000-2002, $110,000

[85] J. Allebach (PI), C. Bouman, and G. Chiu, "*Research in Inkjet Printing Systems,*" Texas Instruments Inc., Award No. 1220001039, 2000-2001, $36,322.75

[86] M. Franchek (PI) and G. Chiu, "*Hydraulic Diagnostics and Prognostics,*" Caterpillar Inc., Award No. 1220001133, 2000-2001, $17,500 ($35,000)

[87] J. Allebach (PI), G. Chiu, and Z. Pizlo, "*Summer and Sabbatical Program,*" Hewlett-Packard Company, Award No. 1120000682, 2000-2001, $33,304

[88] J. Allebach (PI), C. Bouman, G. Chiu, and Z. Pizlo, "*Print Quality Improvement,*" Hewlett-Packard Company, Award No. ERP-20005-1, 2000-2002, $92,537 ($598,460)

[89] G. Chiu, "*Electromechanical Components for Mechatronics Laboratory*," Electrical Manufacturing and Coil Winding Association (EMCWA), 2000, $2,000

[90] J. Allebach (PI), G. Chiu, M. Lehto, and Y. Yih, "*Remote Print Defect Diagnosis*," Hewlett-Packard Company, Award No. ERP-20004, 1999-2002, $31,964

[91] G. Chiu, "*A Step towards Integrating Design and Control of Mechatronic Systems: Plant Uncertainty and External Disturbance Maximization,*" Purdue Research Foundation, Award No. 6903188, 1999-2001, $25,292

[92] G. Chiu, "*Electro-Hydraulic* (*EH*) *Equalization of Multi-cylinder Actuated Lift Systems,*" Rotary Lift Inc., Award No. 1119980546, 1999, $19,300

[93] G. Chiu, "*Electro-Hydraulic Control Systems,*" Rotary Lift Inc., Award No. 1419981153, 1998-2001, $98,700

[94] J. Allebach (PI), C. Bouman, G. Chiu, and Z. Pizlo, "*Research on Artifact Reduction in Digital Printing,*" Hewlett-Packard Company, Award No. 4024670, 1998-2000, $183,977

[95] J.P. Robinson (PI) and G. Chiu, "*Bio-Scope: a Project to Create Biology-Driven Student-Scientist Partnership,*" National Science Foundation, Award No. 9730411-ESI, 1998-2000, $12,455

[96] G. Chiu (PI) and G. Krutz, "*Center for Advancement of Electrohydraulic Teaching and Research – Bridge Fund,*" Caterpillar Inc., Award No. 6712980, 1998-2000, $10,000

[97] J. Allebach (PI), C. Bouman, G. Chiu, and Z. Pizlo, "*Improving Image Quality: Metrics, Models, and Scaling,*" Hewlett-Packard Company, Award No. ERPS-97040.1, 1997-1998, $50,994 ($390,339)

[98] G. Chiu, "*Computer Program for Estimating the Torsional Natural Frequency of Direct Motor Driven Fan Assembly,*" Trane Corporation, Award No. 1119980294, 1998, $8,000

[99] M. Franchek (PI) and G. Chiu, "*Robust Multivariable Control Systems for the Power Management of Wheel Loaders*," Caterpillar Inc., 1997-1999, $69,963 ($139,926)

[100] G. Chiu, "*Feasibility Study of Modularized Intelligent Electro-Hydraulic Systems,*" Purdue Research Foundation, Award No. 6902813, 1997-1999, $23,332

[101] M. Franchek (PI) and G. Chiu, "*Open Architecture Control Platform for In-Class Demonstration of Measurements and Control Systems,*" AT&T Foundation, 1996, $20,000.

[102] G. Chiu (PI) and F. Incropera, "*Establishment of an Instructional Laboratory in Mechatronics,*" Hewlett-Packard Company, 1996, $185,206.