Tse-Shao Chang, Ph.D.

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Website | Google Scholar | LinkedIn | ORCID

Education

2014 B.S. in Mechanical Engineering, National Cheng Kung University (NCKU), Tainan, Taiwan
· Dean's List
· Valedictorian

2018 M.S.E. in Mechanical Engineering, University of Michigan (UMich), Ann Arbor, MI
· Magneto-origami structures | Advisor: Prof. Kon-Well Wang
· Elastic Cable-Driven Micro-Robots | Advisor: Prof. Kenn Oldham

2024 PH.D. in Mechanical Engineering, University of Michigan (UMich), Ann Arbor, MI
· Side-View Photoacoustic Endoscope for Early Cancer Staging | Advisor: Dr. Thomas Wang
· Graduate Computational Discovery and Engineering (CDE) Certificate Program
· Rackham Professional Development Diversity, Equity, and Inclusion (DEI) Certificate Program
· Inclusive STEM Teaching Project, National Science Foundation (NSF) Funded
· Foundational Course Initiative (FCI) | Center for Research on Learning and Teaching (CRLT)

Experience

2011-2012 Research Assistant, Industrial Technology Research Institute (ITRI) project, Applied Solid Mechanics and Electronic Packaging Lab, NCKU

2012-2014 Undergraduate Researcher, Applied Solid Mechanics and Electronic Packaging Lab, NCKU

2015-2016 R&D Intern, Mechanical Engineering Department, Logitech Far East Ltd., Hsinchu, Taiwan

2017-2018 Graduate Researcher, Structural Dynamics and Controls Lab, UMich

2017-2018 Graduate Researcher, Vibration and Acoustics Laboratory: Microsystems, UMich

2018-2019 Research Lab Specialist Associate, Wang Molecular Imaging Laboratory, UMich

2019-2024 Graduate Researcher, Wang Molecular Imaging Laboratory, UMich

2022-2023 Graduate Student Instructor, ME240: Introduction to Dynamics and Vibrations,UMich

2024-Present Senior Mechanical Engineer, ASM, Phoenix, AZ

Publications

Poster Presentations

2018 **Tse-Shao Chang**, Shuo Feng, Zhao Li, Jiye Zhu, Thomas D. Wang, "*In Vivo Fluorescence Imaging of Hepatocellular Carcinoma using Near-infrared Labeled GPC3 peptide*," Michigan Medicine - Peking University Health Science Center Joint Institute for Translational and Clinical Research, 8th Annual symposium, Ann Arbor, Michigan.

2019 **Tse-Shao Chang**, Shuo Feng, Zhao Li, Jiye Zhu, Thomas D. Wang, "*In Vivo Fluorescence Imaging of Hepatocellular Carcinoma using Near-infrared Labeled GPC3 peptide*," 34th Annual University of Michigan Center for Gastrointestinal Research (UMCGR) Winter Retreat, Ann Arbor, Michigan.

2020 **Tse-Shao Chang** and Thomas D. Wang, "*Fiber Scanning Photoacoustic Endoscope for Early Cancer Staging*," 35th Annual University of Michigan Center for Gastrointestinal Research (UMCGR) Winter Retreat, Ann Arbor, Michigan.

2024 **Tse-Shao Chang**, Shuo Feng, Gaoming Li, Haijun Li, Xiaoli Wu, Sangeeta Jaiswal, Eun-Young K. Choi, Guan Xu, Kenn Oldham, and Thomas D. Wang, "*Fiber Scanning Photoacoustic Endoscope for Early Cancer Staging*," 2024 GI and Hepatology Division-wide Research Retreat, Ann Arbor, Michigan.

Conference Presentations

2023 **Tse-Shao Chang**, HaiJun Li, Gaoming Li, Tong Li, Xiaoli Wu, Kenn Oldham, Thomas Wang, "*Fiber-scanning GRIN-lens-based photoacoustic endomicroscope for early colon cancer detection*," SPIE Photonics West, Photons Plus Ultrasound: Imaging and Sensing 2023, San Francisco, CA

Conference Full Paper Publications

2018 Hongbin Fang, **Tse-Shao Chang**, K.W. Wang, "*Controlling Origami Stability Profile Using Magnets*," ASME International Design Engineering Technical Conferences & Computers and Information in Engineering Conference, 42nd Mechanisms and Robotics Conference, DETC2018-85712, Quebec, Canada.

Video Journal Publications

2023 **Tse-Shao Chang**, Yaxuan Zhou, Ruoliu Zhang, Richard S. Kwon, Erik J. Wamsteker, D. Kim Turgeon, Eric J. Seibel, Thomas D. Wang, "*Flexible fiber cholangioscope for detection of near-infrared fluorescence*," VideoGIE, 2023, 8(3): 110-112

Journal Publications

2019 [Hongbin Fang, **Tse-Shao Chang**], K.W. Wang, "*Magneto-Origami Structures: Engineering Multi-Stability and Dynamics via Magnetic-Elastic Coupling*," Smart Materials and Structures, 2019, 29(1), 015026

2019 Xiaoli Wu, Juan Zhou, Fa Wang, Xiaoqing Meng, Jing Chen, **Tse-Shao Chang**, Miki Lee, Gaoming Li, Xue Li, Henry D. Appelman, Rork Kuick, Thomas D. Wang, "*Detection of colonic neoplasia in vivo using near-infrared-labeled peptide targeting cMet*," Scientific Reports, 2019, 9: 17917

2020 Fa Wang, Xiyu Duan, Jing Chen, Zhenghong Gao, Juan Zhou, Xiaoli Wu, **Tse-Shao Chang**, Miki Lee, Gaoming Li, Asma Nusrat, Rork Kuick, Henry D. Appelman, Thomas D. Wang, "*Integrated Imaging Methodology Detects Claudin-1 Expression in Premalignant Nonpolypoid and*

Polypoid Colonic Epithelium in Mice," Clinical and Translational Gastroenterology, 2020 Jan, 11(1): e00089

2020 Jing Chen, Yang Jiang, **Tse-Shao Chang**, Bishnu Joshi, Juan Zhou, Joel H. Rubenstein, Erik J. Wamsteker, Richard S. Kwon, Henry Appelman, David G. Beer, Danielle K. Turgeon, Eric J. Seibel, Thomas D. Wang, "*Multiplexed endoscopic imaging of Barrett's neoplasia using targeted fluorescent heptapeptides in a phase 1 proof-of-concept study*," Gut, 2020, 0:1-4

2021 Yongping Lin, **Tse-Shao Chang**, Jing Chen, Gaoming Li, "*Dual-axis confocal configuration for depth sensitive fluorescence spectroscopy*," Optics Letters, 2021, 46(15)

2021 [Shuo Feng, Xiaoqing Meng, Zhao Li], **Tse-Shao Chang**, Xiaoli Wu, Juan Zhou, Bishnu Joshi, Eun-Young Choi, Lili Zhao, Jiye Zhu, Thomas D. Wang, "*Multi-Modal Imaging Probe for Glypican-3 Overexpressed in Orthotopic Hepatocellular Carcinoma*," Journal of Medicinal Chemistry, 2021, 64: 15639–15650

2022 Jing Chen, Yang Jiang, **Tse-Shao Chang**, Joel H. Rubenstein, Richard S. Kwon, Erik J. Wamsteker, Anoop Prabhu, Lili Zhao, Henry Appelman, Scott R. Owens, David G. Beer, Danielle K. Turgeon, Eric J. Seibel, Thomas D. Wang, "*Detection of Barrett's Neoplasia with Near-infrared Fluorescent Heterodimeric Peptide*," Endoscopy, 2022, 54(12): 1198-1204

2022 [Xiaoli Wu, Xiaoqing Meng], **Tse-Shao Chang**, Shuo Feng, Miki Lee, Sangeeta Jaiswal, Eun-Young Choi, Lam Tran, Hui Jiang, Thomas D. Wang, "*Multi-modal imaging for uptake of peptide ligand specific for CD44 by hepatocellular carcinoma*," Photoacoustics, 2022, 26: 100355

2022 [Miki Lee, Gaoming Li], Haijun Li, Xiyu Duan, Mayur B. Birla, **Tse-Shao Chang**, Danielle K.Turgeon, Kenn R. Oldham, and Thomas D. Wang, "*Confocal Laser Endomicroscope with Distal MEMS Scanner for Real-Time Histopathology*," Scientific Reports, 2022, 12: 20155

2023 Xiaoli Wu, Chun-Wei Chen, Sangeeta Jaiswal, **Tse-Shao Chang**, Ruoliu Zhang, Michael K. Dame, Yuting Duan, Hui Jiang, Jason R. Spence, Sen-Yung Hsieh, Thomas D. Wang, "*Near-Infrared Imaging of Colonic Adenomas In Vivo Using Orthotopic Human Organoids for Early Cancer Detection*," Cancers, 2023, 15(19): 4795

2023 [Gaoming Li, Miki Lee, **Tse-Shao Chang**], Joonyoung Yu, Haijun Li, Xiyu Duan, Xiaoli Wu, Sangeeta Jaiswal, Shuo Feng, Kenn R. Oldham, Thomas D. Wang, "*Wide-field endoscope accessory for multiplexed fluorescence imaging*," Scientific Reports, 2023, 13:19527

2024 Tong Li, **Tse-Shao Chang**, Ahmad Shirazi, Xiaoli Wu, Wei-Kuan Lin, Ruoliu Zhang, L. Jay Guo, Kenn Oldham, Thomas Wang, "*Scaling down the dimensions of a Fabry-Perot polymer film acoustic sensor for photoacoustic endoscopy*," Journal of Biomedical Optics, 2024, 29(S1), S11514

2024 Sangeeta Jaiswal, Fa Wang, Xiaoli Wu, **Tse-Shao Chang**, Ahmad Shirazi, Miki Lee, Michael K. Dame, Jason R Spence, Thomas D. Wang, "*Near-Infrared In Vivo Imaging of Claudin-1 Expression by Orthotopically Implanted Patient-Derived Colonic Adenoma Organoids*," Diagnostics, 2024, 14(3), 273

2024 **Tse-Shao Chang**, Jing Chen, Richard S. Kwon, Yang Jiang, Eric J. Seibel, D. Kim Turgeon, Thomas D. Wang, "*Targeted detection of Barrett's neoplasia: A case report*," Global Translational Medicine, 2024, 3(2), 2223

2024 Xiaoli Wu, Shuo Feng, **Tse-Shao Chang**, Ruoliu Zhang, Sangeeta Jaiswal, Eun-Young Choi, Yuting Duan, Hui Jiang, Thomas Wang, "*Detection of hepatocellular carcinoma in an orthotopic patient-derived xenograft model using a peptide specific for EpCAM*," Cancers, 2024, 16(16), 2818

2025 **Tse-Shao Chang**, Shuo Feng, Gaoming Li, Haijun Li, Xiaoli Wu, Sangeeta Jaiswal, Guan Xu, Hui Jiang, Eun-Young K. Choi, Kenn R. Oldham, Thomas D. Wang, "*Molecularly Targeted Photoacoustic Endoscopy with Fiber-Scanning Side-View Probe for In Vivo Staging of Early Mucosal Tumors*," Biosensors and Bioelectronics, 2025, 288, 117757

2025 Shuo Feng, Xiaoli Wu, Eun-Young K Choi, **Tse-Shao Chang**, Ruoliu Zhang, Sangeeta Jaiswal,

Yuting Duan, Hui Jiang, Thomas D Wang, *"A novel peptide multimer for enhanced imaging and multivalent detection of hepatocellular carcinoma*," Sensors and Actuators B: Chemical, 2025, 44(1), 138310

Under Review Sangeeta Jaiswal, Stephanie The, **Tse-Shao Chang**, Jiaqi Shi, Thomas D Wang, "*Identification of tumor initiating cells and early marker genes in normal colonic epithelium that lead to neoplastic transformation*"

Grant

2020 Rackham Graduate Student Research Grant, "*In Vivo Tumor-Targeted Photoacoustic Imaging of Cancer with Fluorescently-Labeled Peptide*", UMich, $1,468

2022 Rackham Conference Travel Grant, "*Fiber-scanning GRIN-lens-based photoacoustic endomicroscope for early colon cancer detection*" Photons Plus Ultrasound: Imaging and Sensing 2023 Conference, UMich, $900

2024 Rackham Professional Development Grant, "*2nd Annual Taiwanese Elite Career Conference of North America*", UMich, $400

2024 Rackham Graduate Student Research Grant, "*Real-Time Multicolor Imaging of Brain Structure and Function using a Novel Dual Axial Confocal System*", UMich, $3,000

Peer-Review Service

Journals

IEEE Journal of Biomedical and Health Informatics
Big Data and Cognitive Computing
Applied Physics Letters
Journal of Personalized Medicine
Biomedical Signal Processing and Control
Journal of Imaging
Physics in Medicine and Biology
Applied Sciences
Physica Scripta
Electronics
Diagnostics
Cancers
Photonics
Sensors
Chinese Optics Letters
Journal of Clinical Medicine
Review of Scientific Instruments
SPIE Optical Engineering

Conferences

International Design Engineering Technical Conferences (IDETC)
Computers and Information in Engineering Conference (CIE)
Mechanisms and Robotics Conference (MR)
International Conference on Micro- and Nanosystems (MNS)
Design Automation Conference (DAC)
IEEE/ASME International Conference on Mechatronic and Embedded Systems and Applications (MESA)

Membership

Full Member, Sigma Xi, The Scientific Research Honor Society
Member, AAAS (American Association for the Advancement of Science)
Member, SPIE (International Society for Optics and Photonics)
Member, Optica Student Chapter

Mentoring Experience

2010-2012	Peer Assistant Leader, Kaohsiung Graduation Association, NCKU
2018, 2020	Graduate Mentor, Graduate Student Mentoring Program, UMich
2020-2021	Mentor, Graduate Rackham International (GRIN) Mentoring Program, UMich
2022	Mentor, Mechanical Engineering Graduate Council (MEGC), UMich

Department, College, and University Service

2014	Student Judge, Machine Design Competition, NCKU, ME
2016	Volunteer, 8th International Conference on Automotive User Interfaces and Interactive Vehicular Applications, Ann Arbor, MI
2018-2019	Graduate Student Judge, Mechanical Engineering Undergraduate Symposium (MEUS), UMich
2022	Symposium Judge, Undergraduate Research Opportunity Program (UROP) Research Symposium, UMich

Honours & Awards

2011	Outstanding Student Award for Academic Achievement, NCKU
2012	Outstanding Student Award for Academic Achievement, NCKU
2013	Outstanding Student Award for Academic Achievement, NCKU
2013	Undergraduate Researcher Award, NCKU
2014	Young Day National Outstanding University Young Award, China Youth Corps
2014	Valedictorian, NCKU, ME
2020	AAAS/Science Program for Excellence in Science, UMich

Scholarships & Fellowships

2011 Professor Li Ke-Rang Scholarships, NCKU
2012 Professor Li Ke-Rang Scholarships, NCKU
2013 Professor Li Ke-Rang Scholarships, NCKU
2013 Dr. Er-Chang Xie Memorial Scholarship, NCKU
2014 Dr. Chun Ti Chuang Memorial Scholarship, NCKU
2014 Dr. Wei-Noon Wang Memorial Scholarship, NCKU

Last updated: November 8, 2025