# Tse-Shao Chang

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## Current position

Since 2019 *Ph.D. Candidate* in Mechanical Engineering, University of Michigan (UMich), Ann Arbor, MI
· Side-View Photoacoustic Endoscope | Advisor: Prof. 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)

## 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

## 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
Since 2019 Graduate Researcher, Wang Molecular Imaging Laboratory, UMich
2022-2023 Graduate Student Instructor, ME240: Introduction to Dynamics and Vibrations,UMich

## 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.

### 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.

### 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 **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

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, 2223

Accept 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-2985211

Under Review Sangeeta Jaiswal, Stephanie The, **Tse-Shao Chang**, Jiaqi Shi, Thomas D Wang, "*Single cell RNA sequencing identifies tumor initiating cells in histologically normal appearing epithelium and early markers expressed during 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
Journal of Personalized Medicine
Biomedical Signal Processing and Control
Journal of Imaging
Physics in Medicine and Biology
Applied Sciences
Physica Scripta
Electronics
Photonics
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

AAAS member
SPIE member / SPIE student chapter
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

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