Curriculum Vitae

KUANG-TING (K.-T.) HSIAO, PH.D., F.IAAM, SM.NAI
US Citizen

William B. Burnsed, Jr. Department of Mechanical, Aerospace, and Biomedical Engineering, University of South Alabama, 150 Student Services Dr., Shelby Hall 3130, Mobile, AL 36688

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PROFILE

Engineering professor, researcher, inventor, entrepreneur and educator with interests and expertise in advanced materials and manufacturing sciences (including machine-learning for processing design, sensing, and control), technologies, and innovation.

- Professor and Graduate Coordinator William B. Burnsed, Jr. Department of Mechanical, Aerospace, and Biomedical Engineering, University of South Alabama., Mobile, Alabama.
- Google Scholar: https://scholar.google.com/citations?user=ovC7LHMAAAAJ&hl=en. h-index 26, i10-index 42.
- Patents: In google patent record: https://patents.google.com/?inventor=Kuang-Ting+Hsiao. Dr. K.-T Hsiao has 20 issued utility patents (including 6 US, 4 CN, 5 EU, 5 JP patents) and 5 pending non-provisional utility patent applications. In addition to the google patents published patent information, currently, (as of 2024) there are also 1 pending US non-provisional patent application, 1 pending US provisional patent application, and 1 outstanding invention disclosures pending for university tech transfer office's review if it should be converted to provisional patents applications.
- Entrepreneurship Training: National Science Foundation (NSF) Innovation Corps (I-Corps) Teams™, (https://new.nsf.gov/funding/initiatives/i-corps), NSF I-Corps National Teams Los Angeles Cohort 2017. Team: ZT-Composites, Role: Project PI and Technical Mentor, NSF Award Number: 1748369.
- CTO and co-founder of Adelie Blue Technologies LLC, Spanish Fort, Alabama.
- Elected Fellow of IAAM (FIAAM), International Association of Advanced Materials (2024 Class)
- Elected Senior Member of National Academy of Inventors (2024 Class)
- Member of SAMPE, ASME
- Student Research Mentored (including MS theses and Ph.D. dissertations): Graduate: 35; Undergraduate 30.

EDUCATION

Ph.D. September 1994 – January 2000

Mechanical Engineering, University of Delaware, Newark, Delaware, USA

Dissertation: Heat Transfer during Laminar Incompressible Flow of Fluids in Periodic Porous Media

Advisor: Professor Suresh G. Advani

B.S. September 1987 – June 1991
Naval Architecture Engineering, National Taiwan University, Taipei, Taiwan

PROFESSIONAL EXPERENCE

Academic Positions

William B. Burnsed, Jr. Department of Mechanical, Aerospace, and Biomedical Engineering, University of South Alabama, Mobile, AL

- Tenured Full Professor (August 2013-present)
- Graduate Program Coordinator (July 2019-present)
- Lab Director for
    - *Advanced Composites Development Laboratory (ACDL)* (also previously known as *Composite Materials Lab*) (August 2004-present)
    - *Robot-Based Additive Manufacturing System Laboratory* (2020-present)
- Tenured Associate Professor (August 2009-August 2013)
- Tenure-Track Assistant Professor (August 2003 – August 2009)

College of Engineering, University of South Alabama, Mobile, AL

- Director for College of Engineering Core Facility (January 2018-Present)

Center for Composite Materials, University of Delaware, Newark, DE

- Research Associate (September 2000 – August 2003)
- Postdoctoral Fellow (January 2000 – August 2000)

Department of Mechanical Engineering, University of Delaware, Newark, DE

- Graduate Research Assistant (February 1995 – January 2000)

Department of Naval Architecture Engineering, National Taiwan University, Taipei, Taiwan

- Research Assistant (February 1994 – July 1994)

Industrial Entrepreneurship Position

Adelie Blue Technologies LLC, Spanish Fort, Alabama
Co-founder & CTO (August 2022-present).

- Adelie Blue Technologies LLC (ABT) is a small company registered in the State of Alabama since 2022. With its highly innovative team, one of the products/services/technologies ABT is developing now is associated with the Carbon Fiber Sensor technology (a patented technology (US patent no. US 8451013 B1) spun off from the University of South Alabama), which has great potential for being used for products/services/technologies in advanced composites, 3D-printing, smart structures, etc. in various fields. ABT is also interested in SBIR/STTR opportunities and collaborations with academic and industrial partners based on mutual interests.

HONORS AND AWARDS

- *Senior Member*, National Academy of Inventors (2024 Class)
- *Fellow of IAAM (FIAAM)*, International Association of Advanced Materials (2024 Class)
- *IAAM Scientist Medal* lecture entitled 'Synergetic Advantages of Nanofiber Z-threads Reinforcement and Magnetic Compaction Force in 3D Printed Continuous Carbon Fiber Composites", 57th Assembly of Advanced Materials Congress, Hybrid (Onsite/Online), Orlando, USA, Nov 9-12, 2023. (organized by the International Association of Advanced Materials (IAAM)).
- *Outstanding Technical Paper Award - Best Paper in Track: Design, Analysis, and Simulation*, Composites and Advanced Materials Expo 2019 conference (CAMX 2019).
- *Inventor Recognition Award* (2018) by The University of South Alabama Office of Commercialization and Industry Collaboration (OCIC)
- *Russell and Robin Lea National Alumni Excellence in Faculty Innovation Award*, University of South Alabama (2015)
- *Top Professor*, Mortar Board, Azalea Chapter (2011)
- *Olivia Rambo McGlothren National Alumni Outstanding Scholar Award*, University of South Alabama National Alumni Association (2010)
- *Excellence in Research Award*, University of South Alabama College of Engineering (2009) (one award per year of the College of Engineering)
- Who's Who of Emerging Leaders - 1st Edition, 2006
- Who's Who in Science and Engineering (2005)
- Who's Who in America (2004)

PROFESSIONAL SOCIETY LEADERSHIP

- Vice Chair and co-founding member of the Tennessee Valley Professional Chapter (November 2021 – June 2024) of the *Society for the Advancement of Material and Process Engineering (SAMPE)* and working together with other colleagues from industry (Toray, GE, etc.), government labs (NASA/MSFC, DOE/ONRL), and academia (Tuskegee University, Auburn University, etc.) for promoting the advanced materials research, development, and workforce education in government labs/agencies, industry, and academia.
- Board Member of Tennessee Valley Professional Chapter (November 2021 – present) of the *Society for the Advancement of Material and Process Engineering (SAMPE).*

CONFERENCE ORGANIZER/CHAIR

- Co-chair of technical session "Structural Health Monitoring" of SAMPE Tech 2013 conference, Wichita, KS, USA, Oct 21-24, 2013.
- Co-chair of technical session "Nanocomposites: Processing and Fabrication" of SAMPE 2013 conference, Long Beach, CA, USA, May 6-9, 2013.
- Co-chair of technical session "Nanocomposites: Processing and Fabrication" of SAMPE 2012 conference, Baltimore, MD, USA, May 21-24, 2012.
- Co-chair of technical session "Nano Materials: Process & Fabrication" of SAMPE 2011 conference, Long Beach, CA, USA, May 23-26, 2011.

- Symposium co-organizer and session co-chair of "nanaocomposites" topic (4 sessions) and "design and manufacturing of composite materials" topic (1 session)ASME-IMECE 2009, Lake Buena Vista, FL, USA, November 13-19, 2009.
- Session co-chair at SAMPE 2009 Technical Fall Conference, Wichita, KS, USA, Oct 19-22, 2009.
- Symposium co-organizer and session co-chair of Nanocomposites Symposium for ASME-IMECE2008 conference, Boston, MA, USA, Oct 31- Nov 6, 2008.
- Symposium co-organizer and session co-chair of Nanocomposites Symposium for ASME-IMECE2007 conference, Seattle, WA, USA, November 10-16, 2007.
- Symposium co-organizer and session co-chair of Nanocomposites Fabrication and Characterization Symposium in 2006 ASME- International Mechanical Engineering Congress and Exposition (ASME-IMECE2006) conference, Chicago, IL, USA, November 5-10-2006.
- Co-chair for RTM session in the 7th International Conference on Flow Processes in Composite Materials (FPCM7), Newark, DE, USA, July 7-9, 2004.

RESEARCH INTERESTS

As my research have been funded primarily through competitive research proposal grants, I preferred novel research ideas/topics of high risk/high reward. My primary research interests are in manufacturing of advanced composites and have covered a wide spectrum of Technology Readiness Levels (TRLs). My research activities include Basic Research, Technology Feasibility Validation, Technology Development, and Commercialization, as deemed appropriate; the current and past research interests include the following areas:

- Patented novel *Magnetic Compaction Pressure Assisted Additive Manufacturing (MCPA-AM)* methodology and to integrate it with Machine Learning (ML) and IoT related collaborative manufacturing system toward Industry 4.0. This novel digital manufacturing research will create a new knowledge/commercialization space, which will benefit interdisciplinary collaborations of various TRLs. The new research domain will have strong impact on the nation's competitiveness and will create strong market values as well as create opportunities in basic research regarding materials, processing, design, sensors and control. (patents: JP6872268B2, CN109843557B, EP3515690B1, US20190275737A1, JP2021104679A, CN113681887A, EP22164588.0.
- Patented new class of multiscale composites - *Nanofibers (or Nanotubes) Z-threaded CFRP Composites (i.e., ZT-CFRP)*. This new class of advanced composite material produced by the patented process has an interesting 3D, orthogonal, multi-scaled fiber-reinforced microstructure, which yield stronger, lighter, and significantly more conductive thermally and electrically than the state-of-the-art aerospace carbon fiber composites. (Inventors: K-T Hsiao and students, Assignee: University of South Alabama) Current TRL: 4-5. ((IP protected by 9 patents, 4 pending patent applications, see the patent section) US10066065B2, EP3027390B1, CN105517781B, JP6695797B2, US10556390B2, JP6462115B2, CN106660068B, US10947356B2, JP6672268B2, EP3148711A4, EP3189178A4, CN106795656A, PCT/US22/24798.

- Innovation & Entrepreneurship (NSF I-Corps and beyond) (Carbon Fiber Reinforced Polymers (southalabama.edu), MHP Engages in Research Partnership | MHP – A Porsche Company, University of South Alabama, MHP engage in research partnership for plastic composite material | CompositesWorld, ZT-CFRP Composite Material Developed with Nanoparticles and Carbon Fiber Reinforcements | Composites Manufacturing Magazine)
- New applications of multi-functional lightweight CFRP.
- Smart Composite Materials for Aerospace Applications
- Nano Phase Changing Materials (heat conduction, radiation, and flow/solid suspension's heat dispersion, characterization and modeling)
- Structure Health Monitoring (SHM) and real-time cure monitoring and control of CFRP.
- Artificial Intelligence Enabled Manufacturing Automation for Composite Material Parts/Structures. Developed and realized Machine-Learning (ML) driven Streamlined Integration of Design, Planning, Sensing, Control, Database Feedback, Machine Decision to Mitigate Predicted Uncertainty/Risks, and validated such Artificial Intelligence-Self-Learning Systems for Composites Manufacturing Automation (performed and accomplished under ONR funded Advanced Materials Intelligent Processing Center (University of Delaware), 2000-2003)
- Liquid Composite Molding Processes such as RTM, VARTM, SCRIMP, and the variations
- Out-Of-Autoclave Vacuum Bag Only (OOA-VBO) process
- Void and Defect Characterization and Modeling for Polymer Matrix Composites
- Residual Stress and Dimensional Stability of Polymer Matrix Composites
- Nano-Composites and Multiscale Micro-/Nano- Fibers Reinforced Composites Manufacturing and Characterization
- Micro/Nano-fluids and Suspensions in Porous Media
- Functionally Graded Materials
- Adhesive Joint for Polymer Composite Materials
- Rheology, Viscous Flow, ER/MR fluids
- Transport Phenomena in Porous Media
- Numerical Methods
- Sustainable Energy Technologies (energy storage and harvest)

Selected Industrial Collaboration

- Airbus
- Arkema
- Applied Sciences Inc
- Avient Corp.
- Cytec Industries (currently merged under Solvay)
- Dixie Chemical
- Hexcel Corporation
- Hexion
- Huntsman Corporation
- Huntington Ingalls Shipbuilding/US-NAVY

- KAI, LLC
- MHP Americas
- Porsche Motorsport
- Spirit AeroSystems
- Toray
- UST Mamiya
- W.L. Gore and Associates. (Consultant, 1999 – 2000)

GRADUATE STUDENTS

Graduate Students Mentored by Hsiao (35)

Past Graduate Research Students With Theses/Dissertations (24)

1. William Wyatt Taylor (MS-ME student, Summer 2021 - Fall 2023) MS thesis title "NDE approach using in-situ joule heating thermography for adhesively bonded CFRP and ZTCFRP composite joints." (first author of 2 conference papers, co-author for 4 conference papers and 1 journal paper) (funded by NSF grant).
2. Mohammad Rakibul Islam (MS-ME student, Fall 2021 - Summer 2023) MS thesis title: "Enhancement of interlaminar shear strength of carbon fiber reinforced polymer composites with freeform 3D printing using magnetic compaction & ZT-CFRP technologies."(first author for 1 journal paper and 1 conference paper, co-author of 2 conference papers) (funded by NSF grant)
3. Md Nazim Uddin (MS-ME student, Fall 2020-Spring 2022), MS thesis title: "Experimental study of moisture effect on the nanofiber z-threaded carbon fiber reinforced polymer prepreg and its composite." (first author of 1 conference papers (published), co-author for 3 conference papers) (funded by NSF grant)
4. Michael Johnson (MS-ME student, Fall 2019-Summer 2021), MS thesis title: "Preliminary experiment on the interlaminar shear strength of magnetic compaction force assisted additive manufacturing printed Z-treaded carbon fiber reinforced polymer laminate with modified resin blend." (co-author for 1 conference paper)
5. Bikash Ranabhat (Ph.D. of System Engineering student, Summer 2016 - Fall 2020), Dissertation Title: "Magnetic compaction force assisted additive manufacturing of continuous carbon fiber reinforced polymer composites and system architecture investigation using system modeling language (SYSML)", Dissertation defense completed on Oct 7, 2020. (first author of 1 journal paper, 4 conference papers)
6. Sebastian Kirmse, (Ph.D. of System Engineering, Spring 2018 - Fall 2019) Dissertation Title: "Towards the commercialization of carbon fiber composite reinforced with carbon nanofiber z-threads utilizing a hybrid lean launchpad / model-based system engineering approach", Dissertation defense completed on Oct 9, 2019. (first author of 2 journal papers, 2 conference papers; *note that the papers contents used in the candidate's MSME thesis cannot be double-counted toward the DSc degree*)
7. Keonhyeong Kim, (MS-ME student, Summer 2016-Spring 2018), Thesis title: "Modeling transversal support from nanofiber z-threads to a carbon fiber by finite element analysis of multiple carbon fiber reinforced plastic (CFRP) composite unit cell – a potential mechanism to enhance carbon fiber compressive stability", (first author of one conference paper,

received the Outstanding Technical Paper Award - Best in Track: Design, Analysis, and Simulation, Proceedings of CAMX 2019, Anaheim, CA, September 23-26, 2019.)

8. Sebastian Kirmse, (MS-ME student, Spring 2016-Summer 2018), Thesis title: "Interlaminar shear strength enhancement of unidirectional carbon fiber reinforced plastic laminates using carbon nanofiber z-threading technique" (Alabama GRSP scholarship) (coauthor of one journal paper and one conference paper, first author of one conference paper). (Upon completion of MS-ME, he also entered into doctoral study in System Engineering mentored by Hsiao and successfully defended his doctoral dissertation in Fall 2019)
9. Fariborz Bayat, (MS-ME student, Summer 2016-Spring 2018), Thesis title: "Numerical Modeling of Carbon Nanofiber Z-Threaded Carbon Fiber Reinforced Polymer" (Alabama GRSP scholarship) (first author of one conference paper)
10. Alexander Scruggs (MS-ME student, Fall 2015-Spring 2018), Thesis title: "Enhancement of through-thickness electrical conductivity due to carbon nanofiber z-threads in unidirectional carbon fiber reinforced plastic laminates" (first author of one journal paper, two conference papers, coauthor of one journal paper)
11. John Brewer (MS-ME student, part time, thesis option, Fall 2012-Spring 2015), Thesis title: "Delamination toughness characterization of out-of-autoclave vacuum-bag-only polymer matrix composites enhanced by z-aligned carbon nanofibers" (co-author of two conference papers, 1 journal paper)
12. Erin McDonald (MS-ME student, thesis option, Fall 2012-Summer 2014) Thesis title: "Investigation of compaction and permeability during the out of autoclave and vacuum-bag-only (OOA-VBO) manufacturing of a laminate composite with aligned carbon nanofibers) (first author of 2 conference paper, 2 journal paper.)
13. Nathan Brock (MS-ME student, thesis option, Fall 2011-Summer 2014) Thesis title: "An experimental study on the thermal properties of a nano enhanced inorganic salt." (Alabama GRSP scholarship) (co-author of 1 conference paper)
14. Basil Farah (MS-ME student, thesis option, Fall 2012, thesis-defended Oct 2012, graduation expected) Thesis title: "Interlaminar fracture toughness and fatigue delamination of carbon nanofibers modified polyester/glass fiber laminates." (Alabama GRSP scholarship (2009 – 2011 Sept), co-author of 1 journal paper, first author of 1 conference paper and co-author of 7 other conference papers)
15. Andrew Mosley (MS-ME student, thesis option, Fall 2010-Fall 2012, thesis-defended Oct 2012, graduation expected) Thesis title: "An experimental study of the thermal properties of a nano enhanced paraffin wax." (co-author of 1 conference paper)
16. Anusha Rudraraju (MS-ME student, thesis option, Fall 2010-Fall 2012) Thesis title: "Numerical investigation of the enhanced thermal conductivity due to heat dispersion of a nanofluid."
17. Landon Wallace (MS-ME student, thesis option, Fall 2012) Thesis title: "An experimental study of permeability within an out-of-autoclave vacuum-bag-only CFRP laminate." (published 3 conference papers, 1 journal paper)
18. Gregory Hickman (MS-ME student, thesis option, Summer 2013) Thesis title: "Manufacturing of 3-D structured carbon fiber reinforced plastics." (ASGC fellowship) (first author of 2 conference papers, co-author of 1 conference paper, 1 journal paper)

19. Peter Sakalaukus (MS-ME, Aug 2011, MS thesis option) Thesis title: An Experimental Study of the Thermal Conductivity of a Nano Enhanced Phase Change Material (first author of 1 conference paper)
20. Robert Clark III (MS-ME May 2010, MS thesis option), Thesis title: "An experimental study of thermal effects on the Vacuum Assisted Resin Transfer Molding process for manufacturing glassfiber/(epoxy-carbon nanofiber) composites." (ASGC fellowship) (author for 2 conference papers)
21. Kai Jin Teoh (MS-ME December 2009, MS thesis option), Thesis title : "A multi-stage curing technique toward improved dimensional infidelity of curve-shaped composites manufactured with Vacuum Assisted Resin Transfer Molding." (first author for 1 journal paper and 3 conference papers, working in industry and still working on the 2nd journal paper)
22. Kazuhiro Mori (MS-ME August 2008, MS thesis option), Thesis title: "A novel method for characterizing the in-situ residual strain development during polymer matrix composites manufacturing process using carbon fiber sensor." (first author for 1 conference paper)
23. Vishwanath R Kedari (MS-ME July 2008, MS thesis option), Thesis title: "Effect of temperature and pressure on the void content of polyester/E-glass fiber composites manufactured with VARTM process." (first author of 1 conference paper and 1 journal paper)
24. Sudhir Gangireddy (MS-ME Dec 2005, MS thesis option), Thesis title: "Investigation of the spring-in phenomenon of carbon nanofiber reinforced glass fiber/polyester composites during vacuum assisted resin transfer molding." (co-author of 2 journal papers, 2 conference papers)

Past Graduate Research Students Without Theses (9)

1. Jonathan Morrison (MS-ME student, Summer 2016), research direction: literature survey of dispersion of polymer nanoparticle suspension.
2. Kendrick Henderson (MS-ECE student, Fall 2015), research direction: electrical properties evaluation and modeling of z-aligned carbon nanofibers stitched CFRP.
3. Vinay Teja Sudharsanam (MS-ME, Spring 2015-Fall 2015), Research direction: NEPCM for energy management.
4. Joseph A. Stewart (MS student, Summer 2010 – incomplete) left graduate school for a full-time engineering job in FMS during 1st year graduate study at the university. Tried to work full time and study part time but later on couldn't continue) (first author of 1 conference paper)
5. Nimit Bajaj (MS-ME 2006, course work option), with research in "Electro-Rheology of Carbon Nanofibers in Polymer."
6. Omar Restrepo (MS-ME Dec 2005, MS project option), Project title: "Numerical implementation of adaptive control for resin transfer molding (RTM) using spinal flow front location feedback," (co-author of 2 journal papers, 3 conference papers and 1 regional ASME conference paper)
7. Alejandro Rodriguez (MS-ME May 2005, course work option), co-advised with B. Minaie for research in "Optimization of Spine Sensor Location in RTM," (co-author of 1 journal paper, 2 conference papers)

8. Chymar Myint (MS-ME May 2005, course work option), co-advised with B. Minaie for research in "Functional graded composites manufacturing," (first author of 1 regional ASME conference paper)
9. Rex Little (MS-ME May 2005, course work option), co-advised with B. Minaie for research in "Cure kinetics analysis in vacuum assisted resin transfer molding," (co-author of 1 journal paper, 2 conference papers)

Current Graduate Students Mentored by Hsiao (2)

1. Ryan Warren (System Engineering Ph.D. student, Fall 2022 - Spring 2025 (expected)) Ph.D. Dissertation title TBD. Funded by ASGC graduate fellowship, awarded project title "Free-form 3D printing of lightweight and high-strength CFRP." (co-author of a journal paper, and a conference paper, and first author of a conference paper, preparing a first-author journal paper (funded by NASA-ASGC fellowship)
2. Obaidul Hasan (MS-ME student, Fall 2023-Spring 2025) (expected)), MS thesis tentative title "Characterization of novel high temperature behaviors of ZT-CFRP composite laminate") (funded by NSF-PFI grant)

Thesis/Project Committee for Other Faculty Members' Graduate Students: (14)

1. Md Jubaer Alam (Ph.D., Systems Engineering, Electrical Engineering Track, July 2024, Advisor/Committee Chair: S. Latif), Dissertation Committee Member (Advisor/Committee Chair: Saeed I. Latif), "Ultra-thin double negative transparent metamaterial for 5G millimeter-wave applications".
2. Achyuth Rayarao (MS-ME, May 2024, Advisor/Committee Chair: M. Dizbay-Onat), "Investigating the impact of secondary activation time on the adsorption properties of activated biochar for arsenic removal from wastewater".
3. Bibek Bimali, (MS-Electrical Engineering, May 2024, Advisor/Committee Chair: D.W.F Touma), "Drift adaptive accurate net load forecasting: a comprehensive approach to improve model performance".
4. Lynne M.G. Graves, (Ph.D., Computing, July 2019, Advisor/Committee Chair: Mark Yampolskiy)), "Cyber-physical sabotage attacks in additive manufacturing security".
5. Colomb, Matthias A., Dissertation Committee Member (Advisors/Committee Chairs: Nicholas Sylvester and Srinivas Palanki), "Scalable hydrodynamic model for the hydrochlorination reaction and experimental verification on pilot-scale fluidized bed reactor," System analysis of silicon teracholoride fluidized bed reactor", dissertation of Doctor of Science in System Engineering, (May 2016).
6. Krishna Priya Ayalasomayajula (MS-CHE, June 2010, Advisor/Committee Chair: S. Palanki) Thesis title: "Design and analysis of glycerol reformer for fuel cell applications."
7. Shali Vemparala (MS-CHE, Fall 2009, Advisor/Committee Chair: S. Palanki) Thesis title: "Reactor design and cost for producing biodiesel from palm oil for 10 million gallons per year conceptual plant."

8. Basil Farah (MS-ECE Spring 2009, Advisor/Committee Chair: M. R. Parker) Thesis title: "A study of the influence of applied magnetic fields on the hardness of carbon fiber/polyester nanocomposites."
9. Vinay Kumar Vadlamudi (MS-CHE, Dec 2008, Advisor/Committee Chair: S. Palanki) Thesis title: "Analysis of methanol reformer to produce hydrogen for portable fuel cell applications."
10. Kung-Hsien (Aaron) Chen (MS-ECE 2008, Advisor/Committee Chair: S. H. Russ) Thesis title: "Thermally conductive solder masks."
11. Justin Farris (Spring 2008, MS Thesis, Advisor/Committee Chair: M. R. Parker) Thesis title: "Modeling electrical properties of nanocomposites." (first author of 1 conference abstract submission and co-author of 1 conference paper)
12. Praneeth Sivapuram (Spring 2008, MS Thesis, Advisor/Committee Chair: A.-V. Phan) Thesis title: "8552/IM7 unidirectional composites: tensile/compressive strength characterization and finite element transient response analysis of impact loading."
13. Tarek Al-Saadi (Fall 2006, MS Thesis, Advisor/Committee Chair: M. R. Parker) Thesis title: "An experimental study of the alignment of nano particles in epoxy resin using high magnetic fields."
14. Sang-Min Hong (Dec 2005, MS Thesis, Advisor/Committee Chair: A.-V. Phan), Thesis title: "Finite element modeling the solid phase epitaxial growth in boron-doped silicon layers."

UNDERGRADUATE RESEARCH STUDENTS

Past Undergraduate Student Research Mentored by Hsiao (30)

1. Reagan Bonner (funded by RSDG project: Robotic Additive Manufacturing Method for Carbon Fiber Composites) (Feb 2021-June 2022)
2. Mason Brasher (funded by RSDG project: Robotic Additive Manufacturing Method for Carbon Fiber Composites) (Nov 2021- May 2022)
3. David Conner Denton, University Honor Program/University Presidential Scholarship awardee, Tentative Honor Thesis title: "Ocean Geothermal Energy Harvesting", Mechanical. (April 2014 – May 2016).
4. Fariborz Bayat, (June 2015-May 2016) doing research on using FEA to model the 3-D z-aligned multiscaled FRP composites. (He used to do DOE funded project in 2013 but is relocated to the composite project after his interest change after working as summer intern at Airbus, Mobile in 2014 is now a master student conducting research in my group)
5. Kendrick Henderson, NASA funded research assistant, (Electrical Engineering student, Spring 2012-present) works with Gregory Hickman on alignment of CNF (co-advising with Dr. Martin R. Parker (ECE))
6. Andre Milling, (Spring 2014-Spring 2015), DOE funded research assistant, NEPCM Solar Engine.
7. Keane III, Robert, NSF funded research assistant, helped in nanocomposites manufacturing and testing", (Completed), Mechanical. (November 2013 - July 2014).

8. Nikunj Patel (Summer 2014-Fall 2014) NSF funded, helping graduate students in multiscaled composites research.
9. Darla Baria, NSF funded research assistant, (Summer 2013-present) help to manufacturing composite samples and collect and summarize literatures of assigned areas.
10. Asiyeh Zakermosala, NSF funded research assistant, (Spring 2013-present) help to manufacturing composites and related characterization.
11. Jack Russell Combaa, NSF funded research assistant, (Fall 2012-present) helps to measure the thermal energy management performance of NEPCM
12. John Weaver, NSF funded research assistant, (Electrical Engineering student, Spring 2012-present) works on using electrical property change of epoxy containing conductive nanoparticles (co-advised with Dr. Martin R. Parker)
13. Sogon Ngam (Summer 2012), learned how to perform VARTM process and manufactured 3 fiber glass composite samples for a summer bridge program Freshmen Research Experience in Engineering (FREE)
14. Valerie A. Burks (Fall 2011-Spring 2012) Research area: ASTM single lap shear test for nano-adhesive joint of prepreg-based nanocomposite (co-author of 1 conference paper)
15. Jordan Blechert (Fall 2011-Spring 2012) Research area: OOA-VBO prepreg-based nanocomposite manufacturing and in-plane shear strength ASTM characterization.
16. Jie Zhou (Summer 2011, UCUR) Research area: Curing kinetics of pure Epon resin and CNF Epon resin using DSC technique
17. Jeff Gill (Spring 2011) studied on learning ANSYS for thermal conductivity modeling
18. Blakeley Williams (Summer 2010-Spring 2010) Research Area: Millimeter wave thermal response from carbon nanofiber enhanced polyester nanocomposites. (co-advised with Dr. David Nelson (ME) and Dr. Martin Parker (ECE))
19. Gregory Hickman (Summer 2010-Spring 2011, UCUR) Research area: Finite element simulation in composite joint enhancement by carbon nanotubes
20. Joseph A. Stewart (Fall 2009-Fall 2010) Research area: E-flied alignment of CNF in liquid
21. Jake Rhodes (Electrical Engineering, Fall 2009-Spring 2010), task was the same as Aaron Water's. (co-advised with Dr. Martin R. Parker (ECE))
22. Aaron Water (Electrical Engineering, Fall 2009-Spring 2010) Helped to model effective property of nanocomposites and also build a high voltage supply system (co-advised with Dr. Martin R. Parker (ECE))
23. Adam Culberson (Spring 2009-Summer 2010) Research area: natural nanofiber extraction from sisal fibers. (co-advised with Dr. Martin R. Parker (ECE))
24. Nathan Brock (Fall 2008-Spring 2010) Research area: prepreg-based CNF-enhanced CFRP manufacturing.
25. James Ryals (May 2007-Spring 2009, UCUR) Research area: E-field induced alignment of Carbon Nanofibers in polymeric composites, polymer composites manufacturing and mechanical properties testing. (co-author of 2 conference papers)
26. Michael Skinner (ECE, Advisor: M.R. Parker, Spring 2007-Spring 2008) Research area: E-field induced alignment of carbon nanofibers in polymeric composites, polymer composites electrical properties testing. (co-author of 1 conference paper)
27. Robert Clark III (Fall 2006-Spring 2008) Research area: thermal conductivity characterization of nanocomposites. (first author of 1 conference paper)

28. Lu, Khoa D. (Fall 2006-Fall 2007) Final report title: "Research on fatigue mechanics of hybrid nano-/micro- fibers reinforced polymer composites." (first author of 1 conference paper)
29. Peter Gadalla (Fall 2005-Spring 2006), with research in "sensor development for characterizing carbon nanofiber concentration in liquid polymer." (co-author of 1 conference paper)
30. Ramin Sadeghian (Summer 2004-Spring 2005), with research in "manufacturing and mode-I delamination resistance characterization of hybrid carbon nanofiber/glass fiber reinforced polymer composites." (first author of 1 journal paper, 1 conference paper)

Current Undergraduate Students Mentored: (0)

PROPOSALS FUNDED (as the role of Mechanical Engineering Professor of the University of South Alabama since Fall 2003-present)

(Total amount for all listed funded projects: $6,418,558. (Category: Research: $5,379,758; Education: $700,000; Research Fellowship/Scholarship: $338,800))

1. Project Title: Advanced Nanostructured Flame-Resistant Carbon Fiber Reinforced Polymer Composite. Investigator: **PI: Kuang-Ting Hsiao**. Funding Agency: NSF. Duration: 1/1/2025-12/31/2027. Amount: $399,038.
2. Shenghua Wu (PI), **Kuang-Ting Hsiao (co-PI),** Alexandra Stenson (co-PI), Kari Lippert (co-PI), and Lisa LaCross (co-PI) . "Building Industry-Ready Curriculum for Plastics Circularity", NIST, $500,000 (3/1/2024 - 2/28/2027).
3. Project Title (Renewal-3rd year): "Ryan Warren – Free-form 3D printing of lightweight and high-strength CFRP." Graduate Student: Ryan Warren; Faculty Mentor: **K.-T. Hsiao (PI).** Amount: $37,000. Duration: 8/1/2024-7/31/2025. Source: NASA/Alabama Space Grant Consortium (ASGC).
4. Wu, S (PI) and **Hsiao, K.-T. (co-PI),** "Exploration of A Sustainable Asphalt Pavement Containing Recycled Plastics." University of South Alabama Research and Scholarship Development Grant (RSDG) fund, $25,000. (July. 1, 2023 - June 30,2024)
5. Project Title (renewal-2nd year): "Ryan Warren – Free-form 3D printing of lightweight and high-strength CFRP." Graduate Student: Ryan Warren; Faculty Mentor: **K.-T. Hsiao (PI)**. Amount: $37,000. Duration: 8/1/2023-7/31/2024. Source: NASA/Alabama Space Grant Consortium (ASGC).
6. **Hsiao, K.-T. (PI),** K. M. Chambers (co-PI), supplementary fund: Supporting Post-pandemic Research in Nascent Translation (SPRINT) for the project "SPRINT: PFI-TT: High-Volume Manufacturing of Next Generation Carbon Reinforced Pre-Impregnated Polymer Composites " under the NSF Partnerships for Innovation (PFI) Program, $49,999 (April 27, 2023 – September 30, 2024)
7. Project Title: "Ryan Warren – Free-form 3D printing of lightweight and high-strength CFRP." Graduate Student: Ryan Warren; Faculty Mentor: **K.-T. Hsiao (PI).** Amount:

$37,000. Duration: 8/1/2022-7/31/2023. Source: NASA/Alabama Space Grant Consortium (ASGC)

8. Project Title: “Development of a novel magnetic direct 3D printer ” Undergraduate Student: Reagan Bonner; **Faculty Advisor: K.-T. Hsiao**. Duration: 5/17/2022-7/19/2022. Amount: $2,500. Source: University of South Alabama, Summer Undergraduate Research Fellowship Scholarship (SURF). (note, the student also were notified by airbus for summer internship and decided to take the Airbus job and relinquished the fellowship).
9. **Hsiao, K.-T. (PI),** K. M. Chambers (co-PI), supplementary fund: Allowable Patent Expenses (APEX) for the proposal “APEX: PFI-TT: High-Volume Manufacturing of Next Generation Carbon Reinforced Pre-Impregnated Polymer Composites” under the Partnerships for Innovation (PFI) Program, $49,999 (July 20, 2021 – June 30, 2023)
10. **Hsiao, K.-T. (PI),** K. M. Chambers (co-PI), “PFI-TT: High-Volume Manufacturing of Next Generation Carbon Reinforced Pre-Impregnated Polymer Composites”, NSF, $249,999 (Jan 1, 2021 – June 30, 2023)
11. Project Title: "Michael Johnson – Design and testing of novel magnetic compaction force assisted additive manufacturing printing head." Graduate Student: Michael Johnson; Faculty Mentor: **K.-T. Hsiao (PI).** Amount: $37,000. Duration: 8/1/2021-7/31/2022. Source: NASA/Alabama Space Grant Consortium (ASGC) (note, the student relinquished the fellowship and worked in industry instead)
12. **Hsiao, K.-T. (PI),** Woods R.C. (co-PI): "Robotic Additive Manufacturing Method for Carbon Fiber Composites", University of South Alabama Research and Scholarship Development Grant (RSDG) fund, $25,000. (Oct. 1, 2020 - September 30,2022)
13. **Hsiao, K.-T. (PI),** “Expansion of Research Core for Next Generation Composite Materials Manufacturing,” co-funded by Alabama Department of Commerce and University of South Alabama, $502,668. (Oct. 1, 2015 – Sep. 30, 2022)
14. **Hsiao, K.-T. (co-PI),** Contract number:140D04199004, DoD Strategic Capabilities Office (SCO), $978,976 (Feb 2019-Aug 2021) (CUI details not to disclosed)
15. **Hsiao, K.-T. (PI),** “I-Corps: Z-Threaded Carbon Fiber Composite Technology,” National Science Foundation, $50,000, (Oct. 1, 2017 – March 31, 2019)
16. Project Title: “Fariborz Bayat – Numerical Modeling for Z-aligned Nanofiber-Stitched Carbon Fiber Reinforced Polymer Composites.” Graduate Student: Fariborz Bayat; Faculty Mentor: **K.-T. Hsiao (PI).** Amount: $50,000. Duration: 8/1/2016-7/31/2018. Source: NSF/Alabama Commission Higher Education through Alabama EPSCoR Graduate Research Scholars Program (GRSP)
17. Project Title: “Sebastian Kirmse – Characterization of Fracture Mechanisms in Carbon Fiber Composites Reinforced by Carbon Nanofiber Z-Threads during Quasi-Static Loading using Acoustic Emission.” Graduate Student: Sebastian Kirmse; Faculty Mentor: **K.-T. Hsiao (PI).** Amount: $50,000. Duration: 8/1/2016-7/31/2018. Source: NSF/Alabama Commission Higher Education through Alabama EPSCoR Graduate Research Scholars Program (GRSP)
18. Project Title: “The Harvest of Geothermal Energy from Earth’s Ocean” to UCUR program. Investigators: David Conner Denton (Summer Research Student) and **Kuang-Ting Hsiao (Faculty Mentor)**. Funding Source: University of South Alabama. Amount: $2,000. Duration: May 18, 2015-July 24, 2015.

19. **Hsiao, K.-T. (PI),** "Production Development and Characterization on Z-aligned CNF-stitched CFRP," $146,118. Sponsored by Hexcel Corporation (Feb 1, 2015-June 30, 2107).
20. **Hsiao, K.-T. (PI),** Parker, M. R. (Co-PI), "A Preliminary Investigation on the Mechanical and Electrical Performance Improvement of Composites Containing Aligned Carbon Nanofibers" under the main project "Enhancing Alabama's research capacity in nano/bio science and sensors (Alabama NSF-EPSCoR RII) / Nano and bio thrust," Sponsored by NSF-EPSCoR / Tuskegee University, Federal, $65,000. (September 1, 2014 - August 31, 2017).
21. Proposal Title: "Modeling cure and consolidation cycle of carbon nanofiber modified Out Of-Autoclave & Vacuum-Bag-Only (OOA-VBO) CFRP prepregs" Graduate Student: Erin E. McDonald. **Faculty Mentor: K.-T. Hsiao**. Total Amount: $18,000. Duration: 8/1/2013-5/31/2014. Funding Source: NSF/Alabama Commission Higher Education through Alabama EPSCoR Graduate Research Scholars Program (GRSP)
22. **Hsiao, K.-T. (PI),** "Carbon Nano-Particles Based NEPCM," Sponsored by DOE EPSCoR/Alabama, Federal, $31,441. (August 15, 2013 - August 14, 2017).
23. Project Title: "Portable Power Generator with Solar Turbine" to UCUR program Investigators: Fariborz Bayat (Summer Research Student) and **Kuang-Ting Hsiao (Faculty Mentor)**. Funding Source: University of South Alabama. Amount: $2,000. Duration: May 20, 2013-July 22, 2013.
24. Proposal Title: "Enhancing thermal conductivity of phase change salts used in power production using carbon nanofibers." Graduate Student: Nathan Brock. **Faculty Mentor: K.-T. Hsiao.** Total Amount: $18,000. Duration: 8/1/2012-5/31/2013. Funding Source: DOE/Alabama Commission Higher Education through Alabama EPSCoR Graduate Research Scholars Program (GRSP)
25. Proposal Title: "Development & application of nano-enhanced resin film technology for space-related composite materials." Graduate Student: Gregory Hickman. **Faculty Mentor: K.-T. Hsiao**. Amount: $37,000. Duration: Aug 2012- Aug 2013. Funding Source: Alabama Space Grant Consortium (ASGC)
26. Proposal Title: "Resistance Sensor For Nanoparticle Dispersion Monitoring" to UCUR program. Undergraduate Student: Byron Walker; **Faculty Advisor: K.-T. Hsiao**, Amount: $2,000, Duration: 5/1/2012-7/15/2012. Funding Source: University of South Alabama, University Committee on Undergraduate Research (UCUR), Undergraduate Summer Research Fellowship
27. Project Title: "Investigation on Thermal and Curing Behaviors of Nano-Resin." Undergraduate Student: Jie Zhou. **Faculty Advisor: K.-T. Hsiao**. Total Amount: $2,000. Duration: 5/23/2012-7/29/2012. Source: University of South Alabama UCUR program. University Committee on Undergraduate Research (UCUR), Summer Research Fellowship
28. Proposal Title: "NUE: An Interdisciplinary Modular Approach To Nanodevices And Nanotechnology Objectives Through Engineering via Cyberlearning (AIM AT NANOTEC)," PI: Srinivas Palanki and **Co-PIs: Kuang-Ting Hsiao** and Mark L. Adams, Project Duration: 3/15/2011-3/14/2013. Amount: $200,000. Source: NSF
29. Proposal Title: "Enhancing Alabama' research capacity in nano/bio science and sensors (Alabama NSF-EPSCoR RII) / Nano and biomaterials thrust" (through the Alabama NSF-EPSCoR RII program and USA is subcontracted from Tuskegee University) **USA PI: K.-T.**

Hsiao, co-PI: M.R. Parker, Amount to USA: $259,000. Duration: 9/1/2011-8/31/2014. Funding Agency: NSF

30. Proposal Title: "Development of Prepreg and Out-Of-Autoclave Process for Z-Aligned Carbon Nanofiber Toughened Lightweight Composites." (PI: J. C. Gregory (U. of Alabama in Huntsville), **Science-I: K.-T. Hsiao (USA),** co-Is: A.-V. Phan (USA), M.R. Parker (USA), M.V. Hosur (Tuskegee U.), H. Tippur (Auburn University). Total Amount: $1,125,000 (including required 50% match). Duration: 9/1/2010-8/31/2013. Funding Source: NASA (NASA fund transferred to USA from J. C. Gregory, Director/PI of Alabama State NASA EPSCoR Program at U. of Alabama in Huntsville and USA issues subcontracts to Tuskegee U. and Auburn U.)
31. Project Title: "Finite Element Analysis of Carbon Nanotube Reinforced Adhesive to Join Composites". Undergraduate Student: Gregory J. S. Hickman; **Faculty Advisors: K.-T. Hsiao**, A.-V. Phan. Total Amount: $2,000. Duration: 6/1/2010-8/15/2010. Source: University of South Alabama UCUR program. University Committee on Research (UCUR), Undergraduate Summer Research Fellowship
32. Proposal Title: "Multi-scaled resin film-based CF/CNF-Epoxy composite laminates" (Material Transfer Agreement through USA-OTT). **PI: K.-T. Hsiao.** Amount: $2,960. Duration: 12/6/2010-12/6/2011. Source: Spirit AeroSystems Inc., Wichita, KS.
33. Proposal Title: "Nanostructure-Enhanced Phase Change Materials (NEPCM)." (This is subcontracted from Auburn University and the PI for the parent project is J. Khodadadi.) **USA PI: K.-T. Hsiao**. Amount to USA: $273,573 (including required 50% match). Duration: 8/15/2009-8/14/2013. Funding Source: DOE
34. Project Title: "Extraction of cellulose nanofibrils from plant material." Undergraduate Student: Adam Culberson; **Faculty Advisor: K.-T. Hsiao**. Total Amount: $2,000. Duration: 5/26/2009-7/27/2009. Source: University of South Alabama, University Committee on Undergraduate Research (UCUR), Undergraduate Summer Research Fellowship
35. Project Title: "Basil Farah – Electric Field Induced Nanofiber Alignment in Nanocomposites." Graduate Student: Basil Farah; **Faculty Mentor: K.-T. Hsiao**. Amount: $48,000. Duration: 8/15/2009-8/14/2011. Source: NSF/Alabama Commission Higher Education through NSF-Alabama EPSCoR Graduate Research Scholars Program (GRSP)
36. Proposal Title: "Non-Autoclave High-Performance Composite Materials – Manufacturing Process Development, Damage Tolerance Detection and Computational Simulations." PI: A.-V. Phan, **co-PIs**: M.R. Parker, **K.-T. Hsiao**. Total Amount: $200,000. Duration: 10/01/2009 - 9/1/2010. Funding Source: NASA
37. Proposal Title: "Study of Thermal-Fluidic Phenomena in the Non-Isothermal VARTM Manufacturing Process for Polymer Matrix Composites." Graduate Student: Robert L. Clark III; **Faculty Advisor: K.-T. Hsiao**. Amount: $50,000. Duration: 8/16/2008-8/15/2010. Source: NASA/Alabama Space Grant Consortium (ASGC)
38. Proposal Title: "Enhancing Alabama' research capacity in nano/bio science and sensors (Alabama NSF-EPSCoR RII) / Alabama Center for Nanostructured Materials (ACNM)". (through the Alabama NSF-EPSCoR RII program and USA is subcontracted from Tuskegee University) **USA PI: K.-T. Hsiao**, co-PI: M.R. Parker, Amount to USA: $120,000. Duration: 9/1/2008-8/31/2010. Funding Agency: NSF Project Title: "Experimental Investigation of Thermal-Mechanical Properties of Carbon

Nanofiber/Polymer Composite Manufactured under Electrical Field." Undergraduate Student: James Ryals; **Faculty Advisor: K.-T. Hsiao**. Duration: 5/21/2007-8/15/2007. Amount: $2,300. Source: University of South Alabama, University Committee on Undergraduate Research (UCUR), Undergraduate Summer Research Fellowship

39. Proposal Title: "High Strength Composites". PIs: M. R. Parker and A-V Phan: **co-PIs: K.-T. Hsiao**, A. Khan, J. Gou (U. of Central Florida). Total Amount: $778,982. Duration: 10/01/2006-9/30/2008. Funding Source: NASA
40. Proposal Title: "Manufacturing of Functionally Graded Hybrid Carbon Nanotube/Fiber Glass Composites." **PI: K.-T. Hsiao**. Total Amount: $5,000. Duration: 5/1/2004 – 6/30/2005. Source: USA Research Council (USARC)

PENDING PROPOSALS

1. Project Title: MRI: Track 1 Acquisition of a Measurement System for Multi-disciplinary Microelectronics Research, Education, and Training at South Alabama. Investigators: PI: Na Gong, **co-PIs**: Silas Leavesley, **Kuang-Ting Hsiao**, Jinhui Wang, Ryan Benton. Funding Agency: NSF. Duration: 8/1/2024-7/31/2027. Amount: $997,099. Status: Under Review.
2. Project Title: Novel Nano-Hybrid Film to Join a Thermoplastic CFRP with a Thermoset CFRP (tentative). Investigators: **PI: Kuang-Ting Hsiao**, co-PI: Brooks D. Rabideau. Funding Agency: DOD (FY24 DEPSCoR-RC program). Duration: 6/1/2025-5/31/2028. Amount: $599,997. Status: Under Review
3. Project title: ATLAS: Advanced manufacturing for Leveraging Tuned multifunctionality and Autonomous damage Sensing. Investigators: PI: L.D. Thomas (U. of Alabama in Huntsville), Science-I: S. Gururaja (Auburn U.), **co-Is: K-T Hsiao (USA)**, V. Davis (Auburn U.), D. Dean (Alabama State U.), S. Roy (U. of Alabama, Tuscaloosa). Total Amount: $1,125,000 (including required 50% match). Duration: 6/1/2025-5/31/2028. Funding Source: NASA, (NASA fund transferred through Alabama State NASA EPSCoR Program at U. of Alabama in Huntsville to Auburn U.; then Auburn distributes fund to USA, UA, and ASU)

DECLINED PROPOSALS (Submitted and Declined by Funding Agencies)

(Too many to list)

PROPOSALS under Preparation and to be submitted in the near future

1. Project Title (tentative): Transparent Metamaterial Development using High Conductivity Polymers with Copper Nanofibers. Investigators: PI: Saeed Latif, co-PI: **Kuang-Ting Hsiao**. Funding Agency: NSF. Duration: TBD (4 years), Amount: $573,029 (tentatively estimated). Status: proposal under development.

LIST OF PUBLICATIONS

(also see https://scholar.google.com/citations?user=ovC7LHMAAAAJ&hl=en)

BOOKS AND BOOK CHAPTERS

Book

1. *Manufacturing techniques for polymer matrix composites (PMCs)*, Edited by Suresh G. Advani and Kuang-Ting Hsiao, Woodhead Publishing Limited, Cambridge, UK. 2012. (ISBN: 978-0-85709-067-6 (print); ISBN: 978-0-85709625-8 (online))

Book Chapters

1. Suresh G. Advani and Kuang-Ting Hsiao, "Chapter 1. Introduction to composites and manufacturing processes" in *Manufacturing techniques for polymer matrix composites (PMCs),* Edited by Suresh G. Advani and Kuang-Ting Hsiao, Woodhead Publishing Limited, Cambridge, UK, 2012.
2. Kuang-Ting Hsiao and Dirk Heider, "Chapter 10. Vacuum assisted resin transfer molding (VARTM) in polymer matrix composites" in *Manufacturing techniques for polymer matrix composites (PMCs),* Edited by Suresh G. Advani and Kuang-Ting Hsiao. Woodhead Publishing Limited, Cambridge, UK, 2012.
3. Kuang-Ting Hsiao, "Chapter 4, Processing and Mechanical Properties Characterization of Hybrid Thermoset Polymer Composites with Micro-Fiber and Carbon Nano-Fiber Reinforcements" in *Processing and Properties of Nanocomposites*, Edited by Suresh G. Advani, World Scientific Publishing Co., 5 Toh Tuck Link, Singapore 596224, 2007.
4. Suresh G. Advani and Kuang-Ting Hsiao, "Chapter 14, Transport Phenomena in Liquid Composites Molding Processes and their Roles in Process Control and Optimization," in *Handbook of Porous Media, 2nd Edition*, Edited by K. Vafai, pp. 573-606. CRC Press-Taylor & Francis Group, Boca Raton, Florida, 2005.
5. Vincenza Antonucci, Kuang-Ting Hsiao, and Suresh G. Advani, "Chapter 11, Review of Polymer Composites with Carbon Nanotubes" in *Advanced Polymer Materials: Structure Property Relationships*, Edited by Gabriel O. Shonaike and Suresh G. Advani, pp. 397-437, CRC Press LLC, Boca Raton, Florida, 2003.
6. Suresh G. Advani and Kuang-Ting Hsiao, "Chapter 19, Heat Transfer during Mold Filling in Liquid Composite Manufacturing Process" in *Handbook of Porous Media*, Edited by K. Vafai, pp. 845-891, Marcel Dekker, Inc., New York, 2000.

PATENTS

Granted/Issued Patents (20 Utility), further sub-categorized by technology portfolios

- *Carbon fiber sensor technology patent portfolio (1 US patent)*

1. Kuang-Ting Hsiao, "Insulated fiber sensor apparatus and method", US Patent, US 8451013 B1, 2013. (https://www.google.ch/patents/US8451013)

- *ZT-CFRP technology patent portfolio (11 patents- 3US, 3EP, 2CN, 3JP)*

2. Kuang-Ting Hsiao and Gregory Hickman, "(用于生产纳米结构排列的多尺度复合材料的方法)", CN105517781B. Patent Granted, 2017-4-26 (https://www.google.com/patents/CN105517781B?cl=zh)

3. Kuang-Ting Hsiao and Gregory Hickman, “Method for manufacturing nano-structurally aligned multi-scale composites”, US10066065B2, 2018-09-04 (https://patents.google.com/patent/US10066065B2)
4. Kuang-Ting Hsiao,"多孔質媒体中でナノファイバーを一方向に配列する装置及び方法" (English Translation: "Device and method for arranging the nanofibers in one direction in a porous medium"). JP6462115B2*, 2019-01-30.* *(https://patents.google.com/patent/JP6462115B2)*
5. Kuang-Ting Hsiao, " Apparatus and method for directional alignment of nanofibers in a porous medium," US10556390B2, 2020-02-11, (https://patents.google.com/patent/US10556390B2/en)
6. Kuang-Ting Hsiao and Gregory Hickman, "ナノ構造状に配列したマルチスケール複合材料の製造方法", JP6695797B2, 2020-5-20. (https://patents.google.com/patent/JP6695797B2/ja)
7. Kuang-Ting Hsiao and Gregory Hickman, “Method for manufacturing nano-structurally aligned multi-scale composites”, EP3027390B1, 2020-6-24 (https://patents.google.com/patent/EP3027390B1/en)
8. Kuang-Ting Hsiao, "用于多孔介质中的纳米纤维的定向对齐的装置和方法", CN106660068B, 2020-6-26 (https://patents.google.com/patent/CN106660068B/zh)
9. Kuang-Ting Hsiao, “Porous nanocomposite and related method”, US10947356B2, 2021-03-16 (https://patents.google.com/patent/US10947356B2/en)
10. Kuang-Ting Hsiao, "多孔質ナノ複合材料及びその製造方法", JP6672268B2, 2020-03-25 (https://patents.google.com/patent/JP6672268B2/ja)
11. Kuang-Ting Hsiao, “Porous nanocomposite and related method”, EP3189178A4, 2023-04-05 (https://patents.google.com/patent/EP3189178A4/en)
12. Kuang-Ting Hsiao, “Apparatus and method for directional alignment of nanofibers in a porous medium”. EP3148711A4, 2023-08-30 (https://patents.google.com/patent/EP3148711A4/en)

    - *MCFA-AM 3D printing technology patent portfolio (8 patents – 2US, 2CN, 2EP, 2JP)*

13. Kuang-Ting Hsiao, "３ｄ印刷のための方法および装置" (i.e., Methods and equipment for 3D printing) , JP6872268B2, 2021-05-19, (https://patents.google.com/patent/JP6872268B2/ja).
14. Kuang-Ting Hsiao, " 3d 打印的方法和设备", CN109843557B, 2021-09-17 (https://patents.google.com/patent/CN109843557B/zh)
15. Kuang-Ting Hsiao, "Method and apparatus for 3d printing", EP3515690B1, 2022-3-30 (https://patents.google.com/patent/EP3515690B1/en)
16. Kuang-Ting Hsiao, “３ｄ印刷のための方法および装置”, JP7109820B2, 2022-08-01, (https://patents.google.com/patent/JP7109820B2/ja)
17. Kuang-Ting Hsiao, “Method and apparatus for 3D printing”, US11426935B2, 2022-08-30 (https://patents.google.com/patent/US11426935B2/en)
18. Kuang-Ting Hsiao, ”通过 3d 打印生产工件的方法及其制备的工件”（i.e., Method for producing workpiece by 3D printing and workpiece prepared by same), CN113681887B, 2023-05-12 (https://patents.google.com/patent/CN113681887B/en)

19. Kuang-Ting Hsiao, “Method and Apparatus for 3D Printing”, US11858212B2, 2024-01-02 (https://patents.google.com/patent/US11858212B2/en)
20. Kuang-Ting Hsiao, “Method for 3d printing”, EP4049828B1, 2024-01-03 (https://patents.google.com/patent/EP4049828B1/en)

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21. Kuang-Ting Hsiao, “多孔纳米复合材料及相关方法”, CN106795656A, pending (https://patents.google.com/patent/CN106795656A/zh)
22. Kuang-Ting Hsiao and Sebastian Kirmse, “Novel liquid matrix impregnation method and apparatus for composite prepreg production”, WO2022221521A1, pending (2022-10-20 published by WPO) (https://patents.google.com/patent/WO2022221521A1/en)
23. Kuang-Ting Hsiao and Sebastian Kirmse,” 用于复合材料预浸料生产的新型液体基体浸渍方法和设备,” CN117120525A, 2023-11-24, (https://patents.google.com/patent/CN117120525A/zh)
24. Kuang-Ting Hsiao and Sebastian Kirmse,” Novel liquid matrix impregnation method and apparatus for composite prepreg production,” EP4323433A1, 2024-02-21. (https://patents.google.com/patent/EP4323433A1/en)
25. Kuang-Ting Hsiao and Sebastian Kirmse, “Novel liquid matrix impregnation method and apparatus for composite prepreg manufacturing,” JP2024515610A, 2024-04-10. (https://patents.google.com/patent/JP2024515610A/en)
26. Kuang-Ting Hsiao and Sebastian Kirmse, “Novel Liquid Matrix Impregnation Method and Apparatus for Composite Prepreg Production”, US2024014954A1, 2024-05-09. (https://patents.google.com/patent/US20240149541A1/en)

Pending and Not-Yet Published Non-Provisional Patent Applications (1)

1. US Non-Provisional Patent Application, 2024 (other information is non-disclosure till publication) filed by Adelie Blue Technologies LLC.

Pending Non-published Provisional Patent Application (1)

1. US Provisional Patent Application, 2024 (based on University of South Alabama Disclosure ID: 2024-012, (other information is non-disclosure), filed to the University of South Alabama (to be evaluated by the University Tech Transfer for patentability and market value).

Invention Disclosures Not Converted to Patent Applications Yet (1)

1. University of South Alabama Disclosure ID: 2023-023-ENG, (other information is non-disclosure), filed to the University of South Alabama. (to be University is on the process to file the Provisional Patent Application)

Working draft for Invention Disclosure (1)

1. TBA

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1. A. Oyelere1, S. Wu, K-T. Hsiao, M-W Kang, M. Dizbay-Onat, J. Cleary, K. Venkiteshwaran, J. Wang, "Evaluation of Cracking Susceptibility of Asphalt Binders Modified with Recycled High-Density Polyethylene and Polypropylene Microplastics", Construction and Building Materials. 2024; Vol: 438, paper id 136811. https://doi.org/10.1016/j.conbuildmat.2024.136811
2. Islam MR, Uddin MN, Taylor W, Warren R, Hsiao K-T. "Enhancing the Longitudinal Compressive Strength of Freeform 3D-Printed Continuous Carbon Fiber-Reinforced Polymer Composite Laminate Using Magnetic Compaction Force and Nanofiber Z-Threads", *Materials.* 2024; 17(7):1589. https://doi.org/10.3390/ma17071589 .
3. Islam MR, Taylor W, Warren R, Hsiao K-T. Enhancing the Interlaminar Shear Strength and Void Control of 3D-Printed Continuous Carbon-Fiber-Reinforced Polymer Composites Using a Robotic Magnetic Compaction Force-Assisted Additive Manufacturing (MCFA-AM) Process and Carbon-Nanofiber Z-Threads. *Applied Sciences*. 2023; 13(10):5914. https://doi.org/10.3390/app13105914 .
4. Sebastian Kirmse, Robert J. Cloutier, Kuang-Ting Hsiao, "A Comprehensive Commercialization Framework for Nanocomposites Utilizing a Model-Based Systems Engineering Approach", Systems 2021, 9(4), 84; https://doi.org/10.3390/systems9040084.
5. Sebastian Kirmse, Bikash Ranabhat, Kuang-Ting Hsiao, "Experimental and analytical investigation on the interlaminar shear strength of carbon fiber composites reinforced with carbon nanofiber z-threads", Materials Today Communications, Volume 25, December 2020, 101512 (https://doi.org/10.1016/j.mtcomm.2020.101512)
6. Bikash Ranabhat, Joseph Clements, Jacob Gatlin, Kuang-Ting Hsiao, Mark Yampolskiy, "Optimal Sabotage Attack on Composite Material Parts", International Journal of Critical Infrastructure Protection, Volume 26, September 2019, 100301. https://doi.org/10.1016/j.ijcip.2019.05.004.
7. M. Scruggs, S. Kirmse, and K.-T. Hsiao, "Enhancement of Through-Thickness Thermal Transport in Unidirectional Carbon Fiber Reinforced Plastic Laminates due to the Synergetic Role of Carbon Nanofiber Z-Threads." Journal of Nanomaterials, Volume 2019, Article ID 8928917, 13 pages, https://doi.org/10.1155/2019/8928917.
8. K.-T. Hsiao, A.M. Scruggs, J.S. Brewer Jr, G.J.S. Hickman, E.E. McDonald, K. Henderson, "Effect of carbon nanofiber z-threads on mode-I delamination toughness of carbon fiber reinforced plastic laminates." Composites Part A: Applied Science and Manufacturing, Volume 91, December 2016, 324–335. (http://dx.doi.org/10.1016/j.compositesa.2016.10.022)
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73. K.-T. Hsiao and S. G. Advani, "Heat Transfer in Periodic Porous Media", ASME Proceedings of the 32nd National Heat Transfer Conference, Vol. 349, pp. 177-188, Baltimore, MD, August 8-12, 1997.

EXTENDED ABSTRACTS

1. Kuang-Ting Hsiao, Extended Abstract: "Carbon Nanofiber Z-threaded Carbon Fiber Reinforced Polymer Composites: the Interactive Role between the Carbon Fiber and Carbon Nanofiber and the Future", International Conference on Carbon Chemistry and Materials, October 23-27, 2023, Paris, France/Hybrid Conference.
2. Kuang-Ting Hsiao, Mohammad Islam, Wyatt Taylor, Ryan Warren, *IAAM Scientist Medal Lecture*: "Synergetic Advantages of Nanofiber Z-threads Reinforcement and Magnetic Compaction Force in 3D Printed Continuous Carbon Fiber Composites," Advanced Materials World Congress organized by the International Association of Advanced Materials (IAAM), Orlando, USA/Hybrid Conference, Nov 9-12, 2023.

CONFERENCE PRESENTATIONS

1. Presenter at 2024 SPE Automotive Composites Conference and Expo, Novi, MI, September 4-6, 2024.
2. Invited speaker at the International Conference on Carbon Chemistry and Materials, October 23-27, 2023, Paris, France/Hybrid Conference
3. Invited to give an *IAAM Scientist Medal Lecture* at the Advanced Materials World Congress organized by the International Association of Advanced Materials (IAAM), Orlando, USA/Hybrid Conference, Nov 9-12, 2023.
4. Presenter at SAMPE Conference, Charlotte, NA, May 23-26, 2022.
5. Invited Speaker at Advanced Materials WebCongress, Web Symposium on Polymer nanocomposites, celebrating Prof. Joseph H. Koo's 70th Birthday, November 16-18, 2021.
6. Presenter at SAMPE Conference Proceedings. Virtual Series, June 8, 2020.
7. Presenter at CAMX 2019 Conference, Anaheim, CA, September 23-26, 2019.
8. Presenter at SAMPE 2019 Conference, Charlotte, NC, May 20-23, 2019.
9. Presenter at CAMX 2018 Conference, Dallas, TX, October 15-18, 2018.
10. Presenter at SAMPE 2018 Conference, Long Beach, CA, May 21-24, 2018.
11. Presenter at CAMX 2016 Conference, Anaheim, CA, September 26-29, 2016.
12. Presenter at SAMPE 2015 Conference, Baltimore, MD, May 18-22, 2015.

13. Presenter at SAMPE 2013 Conference, Long Beach, CA, May 6-9, 2013.
14. Presenter at SAMPE Tech 2012 Conference, Charleston Convention Center, North Charleston, SC, October 22-25, 2012.
15. Presenter at SAMPE 2012 (Society of the Advancement of Material and Process Engineering), Baltimore, MD, May 21-24, 2012.
16. Presenter at ASME 2011 International Mechanical Engineering Congress & Exposition (IMECE2011), Denver, CO, USA, November 11-17, 2011.
17. Presenter at SAMPE 2011 (Society of the Advancement of Material and Process Engineering), Long Beach, CA, May 23-26, 2011.
18. Presenter at SAMPE Fall Technical Conference 2009, Wichita, KS, October 19-22, 2009.
19. Presenter at SAMPE 2009 conference, Baltimore, MD, May 18-20, 2009.
20. Presenter at 2009 ASME International Mechanical Engineering Congress & Exposition, Lake Buena Vista, FL, USA, November 13-19, 2009.
21. Presenter at 2008 ASME International Mechanical Engineering Congress and Exposition, Boston, MA, USA, October 31 – November 6, 2008.
22. Presenter at SAMPE 2008 conference, Long Beach, CA, May18-22, 2008.
23. Presenter at SAMPE Fall Technical Conference 2007, Cincinnati, OH, October 29November 1, 2007.
24. Presenter at IMECE2007, 2007 ASME International Mechanical Engineering Congress and Exposition, Seattle, WA, USA, November 11-15, 2007.
25. Presenter at SAMPE2007, Baltimore, MD, June 3-7, 2007.
26. Presenter at 2006 ASME International Mechanical Engineering Congress and Exposition (IMECE), Chicago, Chicago, IL, USA, November 5-10, 2006.
27. Presenter at 2005 ASME International Mechanical Engineering Congress and Exposition (IMECE), Orlando, FL, USA, November 5-11, 2005.
28. Presenter at SAMPE2005, Long Beach, CA, May 3&5, 2005.
29. Presenter at 7th International Conference on Flow Processes in Composite Materials, Newark, DE, USA, July 7-9, 2004.
30. Presenter at 2003 ASME International Mechanical Engineering Congress and RD&D Expo Washington D.C., USA, November 15-21, 2003.
31. Presenter at SAMPE 2002, Long Beach, CA, May 14, 2002.
32. Presenter at SAE Aerospace Manufacturing Technology Conference & Exposition, Seattle, WA, September 14, 2001.
33. Presenter at SAMPE 2001, Long Beach, CA, May 7, 2001.
34. Presenter at the 8th U.S.-Japan Conference for Composite Materials, Baltimore, MD, September 1998.
35. Presenter at the 32nd National Heat Transfer Conference, Baltimore, MD, August 12, 1997.

Note: the list doesn't include my presenter role for my research project annual review meetings and industrial collaboration meetings with sponsors and collaborators.

OTHER PRESENTATIONS (E.G. INVITED SEMINARS) AND PUBLICATIONS (E.G. UN-REFEREED PUBLICATIONS SUCH AS NEWSPAPER ARTICLES)

1. Invited participant/presenter at NSF/DOE/APC Workshop: Future Modeling in Composites Molding Processes. Arlington, Virginia, June 9-10, 2004. (PowerPoint presentation available at http://www.missouri.edu/~desy9b/nsf/index.htm).
2. Invited speaker at the Department of Naval Architecture and Ocean Engineering, National Taiwan University, Taipei, Taiwan, December 22, 2000.

COURSES TAUGHT

Undergraduate courses
ME-135 Engineering Graphics and Comm.
EG-284 Dynamics
ME-228 Mechanical Engineering Analysis I
ME-228 Computational Engineering (restructured and renamed in 2023)
ME-328 Mechanical Engineering Analysis II, Mechanical Engineering Analysis (combined)
ME-328 Numerical Methods (restructured and renamed in 2023)
ME-314 Machine Component Design
ME-432 Advanced Thermodynamics

Graduate courses
ME-520 Adv. Fluid Mechanics
ME-540 Advanced Heat Transfer
ME-541 Conduction Heat Transfer
ME-551 Classical Thermodynamics
ME-582 Advanced Materials Science
ME-590 SpTop: Liquid Comp Molding

Note: This list only include the lecture/lab courses. Research/creative courses for individual students such as Directed Independent Study courses, Honor thesis, MS projects, MS theses, Doctoral dissertations are not included in the list.

SERVICE *(list department committees, college committees, university committees you served on, also indicate any external service activities such as (a) reviewer for journals, conferences, and proposal panels, (b) K-12 outreach activities)*

University Service

University-Level Service:

1. Member of Global Research Committee (Spring 2015)
2. Member of Dean's Review Committee (Spring 2015)

College-Level Service:

1. Member of Academic Standard Committee (Summer 2017)
2. Member of Undergraduate Affairs Committee (Fall 2004 – Spring 2008)
3. Chair of Undergraduate Affairs Committee (Fall 2007 – Spring 2008)
4. Committee Member of College of Engineering Excellence in Research Award Selection (2010, 2011, 2012, 2013, 2014, 2015, 2020, 2021, 2022, 2023, 2024)
5. Member of College of Engineering Faculty Affairs Committee (Fall 2011-Summer 2015, Fall 2023-present)
6. Chair of Faculty Affairs Committee (Fall 2014-Summer 2015, Fall 2023-Summer 2024)
7. Member of College of Engineering Scholarship Committee (Fall 2012-Summer 2016)
8. Member of Systems Engineering Doctoral Program Committee (Fall 2012 –Spring 2014)
9. Member of System Engineering Program Faculty Search Committee (Fall 2012-Fall 2015)
10. Member of College of Engineering Promotion and Tenure Committee (Fall 2015-Spring 2025)
11. Chair of College of Engineering Promotion and Tenure Committee (Spring 2025)
12. Founding Director of College of Engineering Core Facility (January 2018-present)
13. Member of College of Engineering Research Committee (September 2020-present)

Departmental-Level Service:

1. Member of Mechanical Engineering Comprehensive Examination Committee (Spring 2004-present)
2. Member of Mechanical Engineering Faculty Search Committee (Fall 2007-Summer 2008, Fall 2010-Summer 2011, Fall 2013-Summer 2014, Fall 2014-Summer 2015, Fall 2015-Summer 2016, Fall 2019-Summer 2020)
3. Chair of Mechanical Engineering Tenure and Promotion Committee (Fall 2014-Summer 2015, Fall 2020-Summer 2021, Fall 2022-Summer 2023)
4. Member of Mechanical Engineering Tenure and Promotion Committee (Fall 2018-Summer 2019, Fall 2019-Summer 2020)
5. Departmental Library Representative (Fall 2014-present)
6. Departmental Graduate Coordinator (July 2019-present)
7. Chair of Departmental Graduate Program Comprehensive Exam Committee (July 2019 – present)
8. Chair of Departmental Research Committee (November 2023- present)
9. Member of BS in Aerospace Engineering Program Proposal Committee (Aug. 2023-Jan. 2024)

Students Thesis Committee: ***(****see details in previous sections:* **GRADUATE STUDENTS , UNDERGRADUATE RESEARCH STUDENTS** ***)***

- Chair of Doctoral Dissertation Committee (3 total, 2 completed and 1 pending)
- Chair of MS Theses (25 total, 24 completed and 1 pending)
- Chair of MS Research Project Committee (1)
- Chair of University Honor BS Thesis Committee (1)
- Member of MS Thesis or Doctoral Dissertation Committee (14)

Extracurricular Activities:

- ACE (Accepting the Challenge to Excel) (Fall 2004, Fall 2005, Fall 2006, Fall 2007)
- Advisor of Pi Tau Sigma (2007-2019)
- Presenter for GEMS (Girls Exploring Math and Science) workshop (Oct 18, 2008)
- Mechanical Engineering representative for USA day, (March 31, 2012)
- Mentor for a RET/REH (research experience for teachers / research experience for High-schoolers) program (2012, 2013, 2014) (sponsored by NSF/Alabama ESPCoR)
- Initiator/corresponding PI/co-coordinator for FREE (Freshmen Research Experience in Engineering) program (Summer 2012), renamed as **E^2** program (Summer 2013, 2014, 2015, 2016) at the University of South Alabama (sponsored by NSF/Alabama ESPCoR).

University-related Community Service:

- Mechanical Engineering Department Representative of USA Faculty Staff Annual Fund Campaign (2007-present)

Professional Service

Professional Society Leadership (see page 3)

Conference Organizer/Chair (see page 3)

Reviewer for Journal Articles, Conference Papers, and Research Proposals

- Composites Part A: Applied Science and Manufacturing
- Composites Part B: Engineering
- Composite Structures
- Composites Science and Technology
- Diamond & Related Materials
- European Polymer Journal
- International Journal of Heat and Mass Transfer
- Journal of Composite Materials
- Journal of Micromechanics and Microengineering
- Journal of Physics D: Applied Physics
- Journal of Porous Media
- Journal of Thermoplastic Composite Materials
- Materials Science and Engineering B
- Modeling and Simulation in Materials Science and Engineering
- Measurement Science and Technology
- Nanotechnology
- Optimization and Engineering
- Polymer
- Conference paper reviewer for ASME- International Mechanical Engineering Congress and Exposition (2008, 2009, 2011)

- Conference paper reviewer for SAMPE Tech Fall Conferences (2009)
- Conference paper reviewer for SAMPE conference (2011, 2012, 2013)
- Served on the Editorial Review Board for *Scientific Journals International (SJI)*
- Served on the Editorial Board for *ISRN Mechanical Engineering*
- Reviewer for book proposal for John Wiley & Sons.
- Reviewer for book proposal for Elsevier.
- Panelist for Michigan 21st Century Jobs Fund proposal review
- Reviewer for ACS Petroleum Research Fund proposals
- Reviewer for National Research Foundation proposal review, South Africa.
- Reviewer for Louisiana Board of Regents proposals review
- Panelist and reviewer of NSF core program (basic research) proposals review
- Panelist for NSF PFI proposals review
- Panelist for NSF AM program proposals review
- Panelist and reviewer of NSF SBIR/STTR Phase I proposals review
- Panelist for NSF SBIR/STTR Phase II proposal review

Invited External Examiner for Ph.D. Thesis

- Nanyang Technological University, Singapore. (QS World University Ranking #13)