

Curriculum Vitae

KUANG-TING HSIAO, PH.D.

Citizenship: U.S.A.

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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 EXPERIENCE

Academic Positions

Department of Mechanical Engineering, University of South Alabama, Mobile, AL

Tenured Full Professor (August 2013-Present)

- Received NSF I-Corps Award titled “I-Corps: Z-Threaded Carbon Fiber Composite Technology” (PI: Hsiao) to implement the evidence-based customer discovery method learned from National I-Corps Cohort. Trained graduate students as Entrepreneur Leads to engage with various industrial sectors to survey/interview a significant number of possible customers and hopefully form a viable business strategy and focus business area. Currently the National I-Crops team is working on some further evaluation of refined selection of companies.
- Submitted a NSF proposal to use PCT patent-pending radial-flow approach to produce ZT-CFRP prepreg tape (about 1/2 inch wide) without using electrical field or magnetic field. Preliminary testing data showed about one-hundred (100) times improvement in the through-thickness directional electrical conductivity compared with traditional CFRP composites.
- Collaborating with *Airbus North America* on developing a NSF GOALI proposal for key material databased development, designing, and implementing the next generation ZT-CFRP in selected aircraft structures for evaluation purposes in various aspects.

- Developing a strategic industrial relationship and secured a multi-year industry-sponsored project from Hexcel Corporation (largest US carbon fiber manufacturer, major carbon fiber composite supplier for Boeing, Airbus and others) as a single PI, and is responsible to lead the collaborative effort in continuous prepreg manufacturing process and testing/characterizations of a next generation CFRP prepreg technology originated from my NASA-funded research outcomes (z-aligned carbon nanofibers-stitched CFRP prepreg or ZT-CFRP prepreg, international patent pending). Responsible in reporting/discussing/documenting discoveries and confidential IP developments to the sponsor, university IP division and Research Compliance division under the contract. Per the science and engineering merit aspect, regardless the commercialization management, it is a very unique cutting edge project with many interesting results that surely will excite the material science and engineering community. As the project PI and a faculty, I will also appropriately publish some interesting results following the legal clauses agreed in the university-sponsor contract.
- As a single-PI, secured a half-million project co-funded by the Alabama Department of Commerce and the University of South Alabama titled “Expansion of Research Core for Next Generation Composite Materials Manufacturing.” I am responsible in acquiring new equipment to enhance my composite materials research capability including a new E-SEM and other strategic equipment, expanding the staffing of my research team and initiating a proprietary 3D FRP printing technology for the future. While the funded project still ongoing, the university already helped to file a US provisional patent application & international PCT patent application of a novel robot-based 3D printing technology for manufacturing Carbon Fiber Reinforced Plastics (CFRP) composite parts without using any mold tooling and with additional features in security and repair of CFRP. Some equipment will be purchased later to support the prototype development and industrial demonstration of this new system. The details will be revealed in the publication of the patent application and/or once the prototype being completed and ready to reveal to potential industrial partners. The default feeding stock for this printing system will be ZT-CFRP due to its great through-thickness direction mechanical properties and thermal conductivity (about seven (7) times of traditional CFRP).
- Received an Airbus A330 wing section (composite elevator) for research and education purposes (<http://www.madeinalabama.com/2016/07/airbus-links-with-alabama-universities/>, News: Airbus links with Alabama universities to build new leaders, July 14, 2016). A current special interest in on study the repair and weather/humidity damage near the rivet holes.
- Received a graduate research assistantship funding form the State of Alabama and strategically collaborate with Airbus for modeling the microstructure of z-aligned carbon nanofibers stitched CFRP (i.e., ZT-CFRP) laminate and learning how to design the structure made of this new generation composite materials.
- Received a graduate research assistantship funding from the State of Alabama to understand the impact and fracture behavior of the new z-aligned CNFs-stitched CFRP (i.e., ZT-CFRP) laminate.
- Since 2013 till now, I, as the inventor, have submitted 5 US provisional patent applications in novel composite technologies (4) and 3D printing (1). One (1) has been granted with US patent, 4 have been converted into multi-national non-provisional PCT patent applications

(1 already be granted with patent in China and others are still pending for individual authorities' responses).

- Served as the Science-PI under a National Aeronautics and Space Administration (NASA) EPSCoR grant, successfully developed the world's first z-aligned long-range nanofibers stitched Carbon Fiber Reinforced Polymer (CFRP) (i.e., ZT-CFRP) composite via a proposed novel prepreg manufacturing process and out-of-autoclave-vacuum-bag-only (OOA-VBO) curing. Validated consistent improvement in mechanical, electrical, and manufacturing advantages over current aerospace-grade carbon fiber reinforced plastics composites. Communicated with companies and agencies about the results. Conducting and managing the further development, collaboration and commercialization activities. Working with University's Technology Transfer Office to handle the related business activities. It is now funded by Hexcel Corporation as a collaborative contract for further development for further scientific discoveries and higher TRL.
- Continuing the Department of Energy (DOE) funded NEPCM (Nanoparticle-Enhanced Phase Change Materials) project. (see more description under Associate Professor duration)
- Continuing the National Science Foundation (NSF) funded nanoparticle dispersion project. Creating methods to control and monitor the dispersion quality of carbon nanofiber in liquid resin over different storage durations and conditions. Creating methods and device to control carbon nanofiber alignment in liquid resin. (see more description under Associate Professor duration)
- Prepared a preliminary experimental feasibility demonstration of a novel geothermal energy harvest approach invited by Defense Advanced Research Projects Agency (DARPA) and submitted a project with the project co-PI, PD and two DOE sub-contractors. (our team didn't win the contract)
- Served a co-PI of a proposal team (PI: Mahesh Hosur, Tuskegee University) of 2016 Alabama's invited extended white paper competition for NSF-EPSCoR proposal submission. Our team was not selected but it was a big proposal integration effort and experience. (\$20M budget for a five years multi-universities project)
- Proposal activities in pursuing further funding for advanced materials researches in multifunctional composites, structural health monitoring, composites manufacturing system, and other of-interest thermal/energy research innovations to appropriate funding sources.
- Developing individual carbon fibers as sensors for curing process monitoring and structural health monitoring of CFRP.
- Co-organizing a Society for the Advancement of Material and Process Engineering (SAMPE) Technical conference (Oct 2013) in the Composites Structure Health Monitoring (SHM).
- Mentoring and supervising graduate students (doctoral students of our new System Engineering program, Master students of Mechanical Engineering) and undergraduate students to perform funded research projects from NASA, DOE, NSF, industry, Alabama Commission on Higher Education (ACHE), Alabama Space Grant Consortium (ASGC), and university internal funding sources.
- Encouraged and Mentored graduate students and undergraduate students to apply for internal and/or external scholarships or fellowship related to my major research areas.

- Served as a committee member for a new Doctor of Science in system engineering program. Successfully recruited a new faculty member.
- Served in various University, College, and Departmental committees as a member or chair in faculty recruiting, system changes, and new initiatives.
- Served as reviewers for professional journals, conferences, and proposals.
- Receiving Russell and Robin Lea National Alumni Excellence in Faculty Innovation Award, University of South Alabama (2015) (One award per year for the University of South Alabama)

Tenured Associate Professor (August 2009-August 2013)

- Developing 3-D structured nano-enhanced high performance composites sponsored by National Aeronautics and Space Administration (NASA). Dr. K.-T. Hsiao served as the Science-PI of this NASA project to integrate the team efforts with four co-PIs' research groups (Drs., Martin Parker, Anh-Vu Phan, Hareesh Tippur, Mahesh Hosur) from three universities (University of South Alabama, Auburn University, Tuskegee University) across the state of Alabama. About 30-60% mechanical performance improvements have been identified through various fracture experiments from different groups for randomly-orientated nano-enhanced CFRP. The multi-university team has been gradually working on summarizing and publishing the results in professional conferences and journals. The team has been moving towards the new generation of 3-D structurally aligned nanofiber and microfiber composite materials with more significant fracture property improvement than the randomly-orientated nano-enhanced CFRP.
- Developing and characterizing Nanoparticle-Enhanced Phase Change Materials (NEPCM) sponsored by Department of Energy (DOE). This project was led by Auburn University (PI: Dr. Jay Khodadadi). Under this collaborative project, Dr. K.T. Hsiao and his students worked on testing and developing various novel NEPCM. Significant thermal conductivity improvement by the addition of nanoparticles in the phase change materials has been found experimentally and the results are in preparation to be submitted for journal publication. Investigation on the heat dispersion and heat convection of liquid phase NEPCM are ongoing.
- Investigating the relationship among the nanoparticle dispersion quality, rheology, shelf life stability, and an externally applied electrical field to align carbon nanofiber in liquid resin. The project is led by Dr. K.-T. Hsiao and Dr. Martin R. Parker and is sponsored by National Science Foundation (NSF) under a subcontract from Tuskegee University. So far, all our results clearly indicated that a carbon nanofiber enhanced resin prepared with a different dispersion quality shows different response to an externally applied electrical field. The systematic investigation is ongoing and will provide the nanotechnology community a new approach to analyze the dispersion quality of nano-fluids.
- Built a unique microscopy apparatus to study the alignment process of nanoparticles suspended in a liquid matrix when being excited by an electrical field. Image analysis program has also been developed to provide statistical information of alignment and elongation of long nanofibers in liquid epoxy. It has been used to support the aforementioned nanomaterials research projects from NASA, DOE, and NSF.

- Worked on a NSF sponsored Nanotechnology Undergraduate Education (NUE) project at the University of South Alabama (USA), titled "NUE: An Interdisciplinary Modular Approach To Nanodevices And Nanotechnology Objectives Through Engineering via Cyberlearning (AIM AT NANOTEC)" (PI: Dr. Palanki, Chemical Engineering and co-PI's: Dr. Mark Adams, Electrical Engineering and Dr. Kuang-Ting Hsiao, Mechanical Engineering). Nanotechnology teaching modules have been developed to be introduced in engineering undergraduate courses for different engineering majors.
- Modeling the dimensional tolerance and the residual stress of curve-shaped composite with different curing strategies.
- Completed a research book titled "Manufacturing Techniques for Polymer Matrix Composites (PMCs)" published by Woodhead Publishing Limited, Cambridge, UK (July 2012). I and Prof. Suresh G. Advani of the University of Delaware jointly served as the editors of this 512-page book. We planned, recruited, organized, reviewed, and edited 14 authoritative review chapters for selected state-of-the-art manufacturing processes for polymer matrix composites. These chapters were authored by internationally recognized experts from Austria, Canada, France, Germany, South Korea, New Zealand, Singapore, Taiwan, and the United States. Each chapter provides a complete and in-depth review of the specific manufacturing process including the application scope, the science and engineering principles, the advantages and disadvantages, recent trends, the associated variations, and highlighted with the outlook recommended by the respective authors. Furthermore, as the editors, Prof. Advani and I have carefully organized the relationships among all chapters so that readers are encouraged to integrate different manufacturing techniques and create new manufacturing processes.
- Filed 2 patent applications. One is granted with US utility patent and is about a novel carbon fiber sensor technology for the Structural Health Monitoring (SHM) and Non-Destructive Evaluation (NDE) of Carbon Fiber Reinforced Polymer (CFRP) composites. Another one is confidential at the current stage.
- Upgraded the composite materials research lab with several pieces of capital equipment.
- Trained graduate and undergraduate research assistants to conduct research and write research papers.
- Taught undergraduate and graduate courses in mechanical engineering.
- Performed proposal writings and academic services.
- Conducted outreach activities. In particular, sponsored by NSF and AlabamaEPSCoR, Dr. K.-T. Hsiao and his colleagues have hosted REH (Research Experience for High-schoolers), RET (Research Experience for Teachers), and initiated a novel summer bridge program FREE (Freshmen Research Experience in Engineering) at the University of South Alabama.

Tenure-Track Assistant Professor (August 2003 – August 2009)

- Conducted research in intelligent liquid composite molding processes. Sensors, pattern recognition algorithms, artificial intelligence (search algorithms), feedback control algorithms, and process models are integrated in this research towards the reliable and affordable composite manufacturing processes. The artificial intelligence, in conjunction with various modeling and sensor technologies, has been proven capable of executing the

process design, real-time characterization of processing related properties, process pattern recognition, and feedback process control. The research aimed at accomplishing short cycle time, high success rate, and minimum process-induced residual stress for advanced polymer composites manufacturing by monitoring and controlling the flow, temperature, and resin cure during liquid composite molding. Objective-Orientated Languages including JAVA and C++ were used for coding the computer programs including the virtual manufacturing environment simulators, the database, and the artificial intelligence engine. The virtual manufacturing environments are governed by the key physical principles of the process.

- Worked on a novel process for manufacturing functionally graded hybrid nanofiber/micro-fiber polymeric composites, which utilizes rheology and electrical field to control the carbon nanofibers alignment and dispersion in micro-fiber/polymer composites.
- Characterized and modeled the advantages obtained by adding carbon nanofibers into the conventional polymer/micro-fiber composites. We validated that the delamination and the dimensional instability of a composite laminate can be significantly inhibited by appropriately introducing carbon-nanofibers into the composite system. The dimensional tolerance can also be significantly improved.
- Studied the void formation during Vacuum Assisted Resin Transfer Molding (VARTM) and developed the method to minimize the void fraction.
- Upgraded the composite materials research lab with several pieces of capital equipment.
- Trained graduate and undergraduate research assistants to conduct research and write research papers.
- Taught undergraduate and graduate courses in mechanical engineering.
- Performed proposal writings and academic services.

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

Research Associate (September 2000 – August 2003)

- Initiated a NSF funded research project with Prof. Suresh G. Advani to investigate the processing of carbon nanotube-reinforced polymeric composites. Co-advised two Ph.D. students and three undergraduate students under this project.
 - Experimentally studied the dispersion of carbon nanotubes in different polymer systems such as Epoxy, Vinylester, and HDPE.
 - Processed the carbon nanotubes into fiberglass and carbon fiber systems to create the hybrid nano/micro fiber reinforced composite materials.
 - Characterized the nano-composite samples by using SEM, TEM, and other mechanical testing methods. The preliminary results suggested that the carbon nanotubes reinforced polymeric composites may have interesting improvements in thermal, mechanical, and electrical properties compared with conventional polymeric composites.
- Conducted research under the ONR funded project - Advanced Materials Intelligent Processing Center (AMIPC). The goal was to develop the Intelligent Processing

technologies including sensing, control, design, and automation for polymer composite manufacturing.

- Developed an algorithm to optimize the flow distribution network for Resin Transfer Molding (RTM) and Vacuum Assisted Resin Transfer Molding (VARTM) processes. By appropriately placing the flow distribution layers and the flow channels in the molding tools, one can fill the large and complex composite parts with less injection pressure and shorter cycle time. This design algorithm is robust and may replace the trial-and-error approach used by the composites industry.
- Developed the algorithms and the design software SLIC (Simulation-based Liquid Injection Control) for optimizing the flow sensing and control solutions in RTM and VARTM processes. The algorithms utilized flow simulations and artificial intelligence to design the locations of sensors and gates along with the computer-friendly instructions for flow sensing and control.
- Developed a flow pattern recognition algorithm to one-shot-characterize the distribution of preform permeability for complex composite parts. This approach can also characterize the local permeability disturbances due to racetracking, corner effects, and preform compaction variations.
- Conducted research to optimize the temperature and thermal stress control of polymeric composites during the RTM processes.
- Prepared and submitted research proposals to external funding agencies or industrial partners to bring in external research funds. Prepared SBIR proposals with the center's industrial partners.

Postdoctoral Fellow (January 2000 – August 2000)

- Investigated the resin flow front control in VARTM by using vacuum pressure difference between dual vents. Derived an analytical solution to predict the pressure change along the resin flow front. Coordinated the experimental verification.
- Utilized FEA to model the VARTM process of integrated composite armors (project funded by Army Research Office). The flow simulation predicted the voids of the integrated armors with the given processing parameters. Proposed the possible solutions for modifying the processing parameters.
- Developed a unit cell approach, which utilized the energy conservation law to couple the microscopic and macroscopic temperature fields to predict the microtemperature distribution of a viscous fluid flowing through porous media. This coupled unit cell approach can be used to predict the temperature and degree of cure of the resin in liquid composite molding processes such as RTM and VARTM.
- Modeled the extrusion of a strain and strain rate dependent viscous fluid for an industrial application by using FIDAP and analytical solutions.

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

Research Assistant (February 1995 – January 2000)

- Modeled the heat transfer and heat dispersion phenomena during the Resin Transfer Molding process (RTM) for composites manufacturing. This research involved

experimental, theoretical, and numerical works to study the heat transfer and heat dispersion phenomena at the mold filling stage during RTM.

- Derived a generalized volume-averaged energy equation to describe the heat dispersion of a flow in periodic porous media at any arbitrary Newtonian observation frame. It was used to model the temperature history during the RTM processes.
- Developed an analytic model to predict the flow behavior during the VARTM processes. The model predicts the lead length of the half saturated flow region, the velocity of the resin flow, and the fill time. It has been used by the composites industry for determining the distance between multiple injection gates in VARTM.
- Built a 3-Dimensional Finite Element Analysis (FEA) computer program to simulate the resin infusion processes (RTM/VARTM/SCRIMP) for composites manufacturing.

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

Research Assistant (February 1994 – July 1994)

- Assisted in building an experimental hardware system to measure the dynamic responses and structural deformation (strain) of a boat cruising in the ocean.
- Assisted in the resistance measurement in the Ship Model Testing Lab.

Selected Industrial Interaction

- Airbus
- Arkema
- Cytex Engineering
- Dixie Chemical
- Hexcel Corporation
- Applied Sciences Inc
- Ingalls Shipbuilding/US-NAVY
- Spirit AeroSystems
- Toray
- W.L. Gore and Associates. (Consultant, 1999 – 2000)

RESEARCH INTERESTS

Affected by recent innovation in composite materials research, my interests and effort-allocation are recently more focused on innovative concepts and realization for making notable and hopefully commercially sustainable advancement. Meanwhile, fortunately enough, the innovations I am developing are also well-tuned to lead to fundamental research that could have transformative impact in other areas. My research interests cover the following areas:

- An Early Stage Novel 3D printing of Carbon Fiber Reinforced Polymer (CFRP) Composite Parts. This is my new initiative funded by Alabama Innovative Fund (Alabama Dept. of Commerce) and provisional patent application & international PCT patent application filed by the University of South Alabama. The realization of the novel technology will also need the integrated effort in many of my other research areas.
- Promising New Z-Aligned Nanofiber (or Nanotube) Stitched CFRP Composites (i.e., ZT-CFRP). (*Used to considered impossible by others till my team make it happen and getting more proofs under NASA and Hexcel's funded projects, multi-national patent pending of a portfolio of patents*)
- New multi-functional lightweight CFRP.
- SHM and real-time cure monitoring and control of CFRP.
- Artificial Intelligence Enabled Composite Material Parts/Structures Manufacturing Integration. Streamlined Design, Planning, Sensing, Control, Database Feedback, Machine Decision to Mitigate Predicted Risks, and Artificial Intelligence-Self-Learning.
- Systems for Composites Manufacturing
- Smart Composite Materials for Aerospace Applications
- 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)

HONORS AND AWARDS

- Russell and Robin Lea National Alumni Excellence in Faculty Innovation Award,, University of South Alabama (2015) (one award per year of the University)
- Top Professor, Mortar Board, Azalea Chapter (2011)
- Olivia Rambo McGlothren National Alumni Outstanding Scholar Award, University of South Alabama National Alumni Association (2010) (one award per year of the University)
- Excellence in Research Award, University of South Alabama College of Engineering (2009) (one award per year of the College of Engineering)
- Who's Who in America (2004-)
- Who's Who in Science and Engineering (2005-)
- Who's Who of Emerging Leaders - 1st Edition, 2006

- Co-chair for RTM session in the 7th International Conference on Flow Processes in Composite Materials (FPCM7), Newark, DE, July 7-9, 2004
- Symposium co-organizer and sessions (4) co-chair of Nanocomposites Fabrication and Characterization Symposium in 2006 ASME-International Mechanical Engineering Congress and Exposition (ASME-IMECE2006) conference, Chicago, IL, November 5-10, 2006
- Symposium co-organizer of Nanocomposites Symposium for ASME-IMECE2007 conference, Seattle, WA, November 10-16, 2007
- Symposium co-organizer of Nanocomposites Symposium for ASME-IMECE2008 conference, Boston, MA, Oct 31- Nov 6, 2008
- Symposium co-organizer of Nanocomposites Symposium for ASME-IMECE2009 conference, Lake Buena Vista, FL, Nov. 13-19, 2009
- Co-chair for “Nano-Enhanced Resins for Aerospace Applications II” session in SAMPE (Society for the Advancement of Material and Process Engineering) 2009 Technical Fall Conference, Wichita, KS, Oct 19-22, 2009
- Co-chair for “Nano Composites, Process and Fabrication” Theme in SAMPE (Society for the Advancement of Material and Process Engineering) 2011 Conference, Long Beach, CA, May 23-26, 2011
- Co-chair of technical session “Nanocomposites: Processing and Fabrication” of SAMPE 2012 conference, Baltimore, MD, May 21-24, 2012
- Co-chair of technical session “Structural Health Monitoring” of SAMPE Tech 2013 conference, Wichita, KS, Oct 22-24, 2013
- Serve on the Editorial Review Board for *Scientific Journals International (SJI)*
- Serve on the Editorial Board for *ISRN Mechanical Engineering*
- Proposal Reviewer or/and Panelist.

GRADUATE STUDENTS

Past Graduate Students Mentored by Hsiao

Past Graduate Research Students With Theses

1. 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)
2. 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.” (lead author of 1 conference paper and 1 journal paper)
3. 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.” (lead author for 1 conference paper)

4. 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.” (lead author for 1 journal paper and 3 conference papers, working in industry and still working on the 2nd journal paper)
5. 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)
6. 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 (lead author of 1 conference paper)
7. Gregory Hickman (MS-ME student, thesis option, Summer 2013) Thesis title: “Manufacturing of 3-D structured carbon fiber reinforced plastics.” (ASGC fellowship) (lead author of 2 conference papers, co-author of 1 conference paper, 1 journal paper)
8. 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)
9. 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.”
10. 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)
11. 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, lead author of 1 conference paper and co-author of 7 other conference papers)
12. 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.” (GRSP scholarship) (co-author of 1 conference paper)
13. 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) (lead-author of 2 conference paper, 2 journal paper.)
14. 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)

Past Graduate Research Students Without Theses

15. 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)
16. Chymar Myint (MS-ME May 2005, course work option), co-advised with B. Minaie for research in “Functional graded composites manufacturing,” (lead author of 1 regional ASME conference paper)
17. 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)
18. 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)
19. Nimit Bajaj (MS-ME 2006, course work option), with research in “Electro-Rheology of Carbon Nanofibers in Polymer.”
20. 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) (lead author of 1 conference paper)
21. Vinay Teja Sudharsanam (MS-ME, Spring 2015-Fall 2015), Research direction: NEPCM for energy management.
22. Kendrick Henderson (MS-ECE student, Fall 2015), research direction: electrical properties evaluation and modeling of z-aligned carbon nanofibers stitched CFRP.
23. Jonathan Morrison (MS-ME student, Summer 2016), research direction: literature survey of dispersion of polymer nanoparticle suspension.

Current Graduate Students Mentored by Hsiao

1. Alexander Scruggs (D.Sc. of System Engineering student, Fall 2014-Spring 2017 (expected)), research direction: Systematic evaluation of novel z-aligned carbon nanofibers stitched CFRP for continuous volume production.
2. Bikash Ranabhat (D.Sc. of System Engineering student, Summer 2016-Spring 2019 (expected)), research direction: Study of 3D printing system for CFRP composite parts.
3. Fariborz Bayat, (MS-ME student, Summer 2016-Fall 2017 (expected)), research direction: FEA modeling of a novel 3-D z-aligned multiscaled FRP composites.
4. Sebastian Kirmse, (MS-ME student, Summer 2016-Spring 2017 (expected)), research direction: Acoustic Emission Analysis During the Impact Fracture Process of a novel 3-D z-aligned multiscaled FRP composites.

Thesis/Project Committee for Other Faculty Members’ Graduate Students:

1. 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."
2. 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."
3. 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."
4. Justin Farris (Spring 2008, MS Thesis, Advisor/Committee Chair: M. R. Parker) Thesis title: "Modeling electrical properties of nanocomposites." (lead author of 1 conference abstract submission and co-author of 1 conference paper)
5. Kung-Hsien (Aaron) Chen (MS-ECE 2008, Advisor/Committee Chair: S. H. Russ) Thesis title: "Thermally conductive solder masks."
6. 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."
7. 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."
8. 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."
9. Krishna Priya Ayalasangamajula (MS-CHE, June 2010, Advisor/Committee Chair: S. Palanki) Thesis title: "Design and analysis of glycerol reformer for fuel cell applications."
10. 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 tetrachloride fluidized bed reactor", dissertation of Doctorate of Science in System Engineering, (November 13, 2013 – May 2016).

UNDERGRADUATE RESEARCH STUDENTS

Past Undergraduate Student Research Mentored by Hsiao

1. 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." (lead author of 1 journal paper, 1 conference paper)
2. 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)
3. Lu, Khoa D. (Fall 2006-Fall 2007) Final report title: "Research on fatigue mechanics of hybrid nano-/micro- fibers reinforced polymer composites." (lead author of 1 conference paper)

4. Robert Clark III (Fall 2006-Spring 2008) Research area: thermal conductivity characterization of nanocomposites. (lead author of 1 conference paper)
5. 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)
6. 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)
7. Nathan Brock (Fall 2008-Spring 2010) Research area: prepreg-based CNF-enhanced CFRP manufacturing.
8. Adam Culberson (Spring 2009-Summer 2010) Research area: natural nanofiber extraction from sisal fibers. (co-advised with Dr. Martin R. Parker (ECE))
9. 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))
10. Jake Rhodes (Electrical Engineering, Fall 2009-Spring 2010), task was the same as Aaron Water's. (co-advised with Dr. Martin R. Parker (ECE))
11. Joseph A. Stewart (Fall 2009-Fall 2010) Research area: E-field alignment of CNF in liquid
12. Gregory Hickman (Summer 2010-Spring 2011, UCUR) Research area: Finite element simulation in composite joint enhancement by carbon nanotubes
13. 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))
14. Jeff Gill (Spring 2011) studied on learning ANSYS for thermal conductivity modeling
15. Jie Zhou (Summer 2011, UCUR) Research area: Curing kinetics of pure Epon resin and CNF Epon resin using DSC technique
16. Jordan Blechert (Fall 2011-Spring 2012) Research area: OOA-VBO prepreg-based nanocomposite manufacturing and in-plane shear strength ASTM characterization.
17. 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)
18. 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)
19. 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)
20. Jack Russell Combaa, NSF funded research assistant, (Fall 2012-present) helps to measure the thermal energy management performance of NEPCM
21. Asiyeh Zakermosala, NSF funded research assistant, (Spring 2013-present) help to manufacturing composites and related characterization.
22. Darla Baria, NSF funded research assistant, (Summer 2013-present) help to manufacturing composite samples and collect and summarize literatures of assigned areas.
23. Nikunj Patel (Summer 2014-Fall 2014) NSF funded, helping graduate students in multiscaled composites research.

24. Keane III, Robert, NSF funded research assistant, helped in nanocomposites manufacturing and testing", (Completed), Mechanical. (November 2013 - July 2014).
25. Andre Milling, (Spring 2014-Spring 2015), DOE funded research assistant, NEPCM Solar Engine.
26. 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))
27. 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)
28. David Conner Denton, University Honor Program/University Presidential Scholarship awardee, Tentative Honor Thesis title: "Ocean Geothermal Energy Harvesting", Mechanical. (April 2014 – May 2016).

Current Undergraduate Students Mentored:

N.A.

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

(Total amount for all listed funded projects: \$3,877,602)

Research Projects

(Total amount: \$3,452,302)

1. Hsiao, K.-T. (PI), "I-Corps: Z-Threaded Carbon Fiber Composite Technology," National Science Foundation, \$50,000, (Oct. 1, 2017 – March 31, 2018)
2. 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, 2017)
3. 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).
4. 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).
5. Hsiao, K.-T. (PI), "Carbon Nano-Particles Based NEPCM," Sponsored by DOE EPSCoR/Alabama, Federal, \$31,441. (August 15, 2013 - August 14, 2017).

6. 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: \$1,012,555 (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.)
7. 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
8. 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
9. Proposal Title: “Multi-scaled resin film based CF/CNF-Epoxy composite laminates” (Material Transfer Agreement through USA-OTT). K.-T. Hsiao is the PI. Amount: \$2,960. Duration: 12/6/2010-12/6/2011. Source: Spirit AeroSystems Inc., Wichita, KS.
10. 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
11. 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
12. 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
13. 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)

Education Projects

(Total amount:\$200,000)

14. 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

Research projects to support students research activities (most of the students' topics are merged into my major research projects)

(Total amount: \$225,300)

1. 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: Alabama Commission Higher Education through Alabama EPSCoR Graduate Research Scholars Program (GRSP)
2. 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: Alabama Commission Higher Education through Alabama EPSCoR Graduate Research Scholars Program (GRSP)
3. 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: Alabama Space Grant Consortium (ASGC)
4. 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: Alabama Commission Higher Education through Alabama EPSCoR Graduate Research Scholars Program (GRSP)
5. 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)
6. 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: Alabama Commission Higher Education through Alabama EPSCoR Graduate Research Scholars Program (GRSP)
7. 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. Alabama Commission Higher Education through Alabama EPSCoR Graduate Research Scholars Program (GRSP)
8. 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
9. 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

10. 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
11. 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
12. 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
13. 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.
14. 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.

LIST OF PUBLICATIONS

(also see <https://scholar.google.com/citations?user=ovC7LHMAAA AJ&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 Patents

1. Kuang-Ting Hsiao, “Insulated fiber sensor apparatus and method”, US Patent, US 8451013 B1, 2013. (<https://www.google.ch/patents/US8451013>)
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, Apr 26, 2017. (<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>)

Pending Patent Applications

1. Kuang-Ting Hsiao and Gregory Hickman, “Method for manufacturing nano-structurally aligned multi-scale composites”, Pub. No.: WO2015017321, International Application No.: PCT/US2014/048406, EP3027390A1, JP 2016531794. (Pending) (<https://www.google.com/patents/WO2015017321A1?cl=en>)
2. Kuang-Ting Hsiao, “Apparatus and method for directional alignment of nanofibers in a porous medium”. Pub. No. WO2015184151, International Application No.: PCT/US2015/033000, EP20150798682, JP2017515015, CN 201580028201. (<https://patentscope.wipo.int/search/en/detail.jsf?docId=WO2015184151>)
3. Kuang-Ting Hsiao, “Porous nanocomposite and related method”. Pub. No. WO2016036663, International Application No.: PCT/US2015/047753, EP3189178, (<https://patentscope.wipo.int/search/en/detail.jsf?docId=WO2016036663>)
4. Kuang-Ting Hsiao, “Method and apparatus for 3D printing”, International Application No.: PCT/US17/52783. (<https://patentscope.wipo.int/search/en/detail.jsf?docId=WO2018057784>)

REFEREED JOURNAL PUBLICATIONS

1. A. 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* (in press).
2. 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>)
3. Salehi M, Krishnamurthy A, Forster AM, KT Hsiao, Whelton AJ. “Polyester composite water uptake and organic contaminant release affected by carbon nanofiber reinforcements.” *Journal of Applied Polymer Science* 133 (30). 2016. (DOI: 10.1002/app.43724)
4. Jefferson, G. D., Farah, B., Hempowicz, M., Hsiao, K.-T. “Influence of hygrothermal aging on carbon nanofiber enhanced polyester material systems.” *Composites: Part B*. Volume 78, Pages 319–323. 2015. (doi:10.1016/j.compositesb.2015.03.088)
5. Rahman, M. M., Hosur, M., Hsiao, K.-T., Wallace, L., Jeelani, S. “Low velocity impact properties of carbon nanofibers integrated carbon fiber/epoxy hybrid composites manufactured by OOA–VBO process. *Composite Structures*,” 120, 32-40, 2014. (dx.doi.org/10.1016/j.compstruct.2014.09.053)
6. McDonald, E. E., Wallace, L. F., Hickman, G. J.S., Hsiao, K.-T. “Manufacturing and Shear Response Characterization of Carbon Nanofiber Modified CFRP Using the Out-of-Autoclave-Vacuum-Bag-Only Cure Process.” *The Scientific World Journal*, 2014, Article ID 830295, 9 pages. (<http://dx.doi.org/10.1155/2014/830295>)
7. Kuang-Ting Hsiao, “Embedded single carbon fibre to sense the thermomechanical behavior of an epoxy during the cure process,” *Composites: Part A: Applied Science and Manufacturing* 46, 117–121, 2013.
8. Vishwanath R. Kedari, Basil Farah, and Kuang-Ting Hsiao, “Effects of vacuum pressure, inlet pressure, and mold temperature on the void content, volume fraction of polyester/Eglass fiber composites manufactured with VARTM process,” *Journal of Composite Materials*. *Journal of Composite Materials* 45(26) 2727–2742, 2011.
9. Kai Jin Teoh and Kuang-Ting Hsiao, “Improved dimensional infidelity of curve-shaped VARTM composite laminates using a multi-stage curing technique – Experiments and modeling,” *Composites: Part A: Applied Science and Manufacturing* 42 (7), pp. 762-771, 2011.
10. Xiaoyong Jia, Hui Li, David Hui, Kuang-Ting Hsiao, Jinping Ou, and Alan K.T. Lau, “I-V characteristics and electromechanical behaviors of epoxy matrix composites containing different carbon black particles,” *Composites Part B: Engineering*. 41(1), 2532, 2010.
11. Kuang-Ting Hsiao and Sudhir Gangireddy, “Investigation on the spring-in phenomenon of carbon nanofiber-glass fiber/polyester composites manufactured with vacuum assisted resin transfer molding,” *Composites Part A: Applied Science and Manufacturing*, 39(5), 834-842, 2008.

12. O. Restrepo, K.T. Hsiao, A. Rodriguez, B. Minaie, "Development of adaptive injection flow rate and pressure control algorithms for resin transfer molding," *Composites Part A: Applied Science and Manufacturing*, 38(6), 1547-1568, 2007.
13. Ramin Sadeghian, Sudhir Gangireddy, Bob Minaie, Kuang-Ting Hsiao, "Manufacturing carbon nanofibers toughened polyester/glass fiber composites using vacuum assisted resin transfer molding for enhancing the mode-I delamination resistance," *Composites Part A: Applied Science and Manufacturing*, 37(10), 1787-1795, 2006.
14. K.T. Hsiao, R. Little, O. Restrepo, B. Minaie, "A Study of Direct Cure Kinetics Characterization During Liquid Composite Molding," *Composites Part A: Applied Science and Manufacturing*, 37(6), 925-933, 2006.
15. M. Devillard, K.T. Hsiao and S. G. Advani, "Flow sensing and control strategies to address race-tracking disturbances in resin transfer molding---Part II: automation and validation," *Composites Part A: Applied Science and Manufacturing*, 36(11), 1581-1589, 2005.
16. K.-T. Hsiao and S. G. Advani, "Flow sensing and control strategies to address racetracking disturbances in resin transfer molding---Part I: design and algorithm development," *Composites Part A: Applied Science and Manufacturing*, 35(10), 1149– 1159, 2004.
17. K.-T. Hsiao, M. Devillard, and S. G. Advani, "Simulation Based Flow Distribution Network Optimization for Vacuum Assisted Resin Transfer Molding Process," *Modeling and Simulation in Materials Science and Engineering*, 12(3), pp. S175-S190, 2004.
18. Zhihang Fan, Kuang-Ting Hsiao and Suresh G. Advani, "Experimental Investigation of Dispersion during Flow of Multi-Walled Carbon Nanotube/Polymer Suspension in Fibrous Porous Media," *Carbon*, Volume 42, Issue 4, pp.871-876, 2004.
19. M. Devillard, K.-T. Hsiao, A. Gokce, and S. G. Advani, "On-line characterization of bulk permeability and race-tracking during the filling stage in resin transfer molding process," *Journal of Composite Materials*, 37(17), pp. 1525-1541, 2003.
20. K.-T. Hsiao, J. Alms, S.G. Advani, "Use of epoxy/multiwalled carbon nanotubes as adhesives to join graphite fibre reinforced polymer composites," *Nanotechnology*, 14, pp. 791-793, 2003.
21. A Gokce, K.-T. Hsiao, S. G. Advani, "Branch and Bound Search to Optimize Injection Gate Locations in Liquid Composites Molding Processes," *Composites Part A: Applied Science and Manufacturing*, 33(9), pp. 1263-1272, 2002.
22. J. M. Lawrence, K.-T. Hsiao, R. C. Don, P. Simacek, G. Estrada, M. Sozer, H. C Stadtfeld, Suresh G. Advani, "An approach to couple mold design and online control to manufacture complex composite parts by resin transfer molding," *Composites Part A: Applied Science and Manufacturing*, 33(7), pp. 981-990, 2002.
23. V. Antonucci, M. Giordano, K.-T. Hsiao, S. G. Advani, "A methodology to reduce thermal gradients due to the exothermic reactions in composites processing," *International Journal of Heat and Mass Transfer*, Vol. 45, pp.1675-1684, 2002.
24. K.-T. Hsiao and S. G. Advani, "A coupled approach to predict microscopic temperature distribution inside a unit cell of nonisothermal laminar flow in periodic porous media," *J. of Porous Media* 5(2), 69-85, 2002.
25. K.-T. Hsiao, J. W. Gillespie Jr., S. G. Advani, and B. K. Fink, "Role of Vacuum Pressure and Port Locations on Flow Front Control for Liquid Composites Molding Processes," *Polymer Composites*, Vol. 22, No. 5, pp. 660-667, 2001.

26. K. -T. Hsiao, H. Laudorn, and S. G. Advani, "Experimental Investigation of Heat Dispersion Due to Impregnation of Viscous Fluids in Heated Fibrous Porous Media During Composites Processing," ASME J. of Heat Transfer, Vol. 123, No. 1, pp 178187, 2001.
27. K.-T. Hsiao, R. Mathur, S. G. Advani, J. W. Gillespie Jr., B. K. Fink, "A Closed Form Solution for Flow During the Vacuum Assisted Resin Transfer Molding Process", ASME J. of Manufacturing Science and Engineering, Vol. 122, No. 3, pp.463-475, 2000.
28. K.-T. Hsiao and S. G. Advani, "A Theory to Describe Heat Transfer during Laminar Incompressible Flow of a Fluid in Periodic Porous Media," Physics of Fluids, Vol. 11, No. 7, pp. 1738-1748, 1999.
29. K.-T. Hsiao and S. G. Advani, "Modified Effective Thermal Conductivity Tensor due to Heat Dispersion in Fibrous Porous Media," Int. J. of Heat Mass Transfer, Vol. 42, No. 7, pp. 1237-1254, 1999.

CONFERENCE PUBLISHED PROCEEDINGS

1. S. Kirmse, K.-T. Hsiao, "ENHANCING THE INTERLAMINAR SHEAR STRENGTH OF UNIDIRECTIONAL CARBON FIBER REINFORCED PLASTIC (CFRP) LAMINATE USING A NANOFIBER Z-THREADING STRATEGY." Proceedings of CAMX 2018, Dallas, Texas. October 15-18, 2018.
2. F. Bayat, K.-T. Hsiao, "MECHANICAL BEHAVIOR MODELING OF UNIDIRECTIONAL CARBON FIBER REINFORCED POLYMER COMPOSITES REINFORCED WITH Z-DIRECTIONAL NANOFIBERS." Proceedings of SAMPE 2018, Long Beach, CA, May 21-24, 2018.
3. B. Ranabhat, K.-T. Hsiao, "IMPROVE THE THROUGH-THICKNESS ELECTRICAL CONDUCTIVITY OF CFRP LAMINATE USING FLOWALIGNED CARBON NANOFIBER Z-THREADS." Proceedings of SAMPE 2018, Long Beach, CA, May 21-24, 2018.
4. A.M. Scruggs, S. Kirmse, K.-T. Hsiao, "INFLUENCE OF Z-ALIGNED CARBON NANOFIBERS ON THE THROUGH-THICKNESS THERMAL CONDUCTIVITY OF PARAFFIN WAX." Proceedings of the 2016 ASME International Mechanical Engineering Congress & Exposition (ASME-IMECE 2016), November 11-17, 2016, Phoenix, Arizona, USA. Paper number 67795.
5. A.M. Scruggs, K. Henderson, K.-T. Hsiao, "CHARACTERIZATION OF ELECTRICAL CONDUCTIVITY OF A CARBON FIBER REINFORCED PLASTIC LAMINATE REINFORCED WITH Z-ALIGNED CARBON NANOFIBERS." Proceedings of CAMX (the Composites and Advanced Materials Expo) 2016, Anaheim, CA, September 26-29, 2016.
6. Hsiao, K.-T., Brewer Jr., J. S., Hickman, G. J.S., McDonald, E. E., Henderson, K. Mode-I Delamination Characterization of OOA-VBO cured Z-aligned Carbon Nanofiber Stitched CFRP Composites (pp. 11 pages). Proceedings of SAMPE 2015 (Society of the Advancement of Material and Process Engineering), Baltimore, MD, May 18-21, 2015.
7. McDonald, E. E., Henderson, K., Hickman, G. J.S., Hsiao, K.-T. "Axial and transverse air permeability of laminate of CFRP prepregs containing z-aligned carbon nanofibers (11

- pages), Proceedings of SAMPE 2015 (Society of the Advancement of Material and Process Engineering), Baltimore, MD, May 18-21, 2015.
8. Hsiao, K.-T., Hickman, G. J.S., McDonald, E. E., Brewer Jr., J. S., Henderson, K., Parker, M. R. (2014). CHARACTERIZATION OF A BREAKTHROUGH MULTISCALE CFRP COMPOSITE REINFORCED WITH LONG-RANGE NANO-Z-THREADS (pp. 12 pages). Proceedings of SAMPE Tech 2014 (Society of the Advancement of Material and Process Engineering), Seattle, WA, June 2-5, 2014.
 9. Steadman, S. J., & Jefferson, G. D., & Thomas, T. G., & Hsiao, K. (2014, June), Impacting First-Year Engineering Retention Paper presented at 2014 ASEE Annual Conference & Exposition, Indianapolis, Indiana. <https://peer.asee.org/20594> .
 10. Steadman, S. J., & Jefferson, G. D., & Thomas, T. G., & Hsiao, K. (2014, June), First-Year Engineering Summer Session Paper presented at 2014 ASEE Annual Conference & Exposition, Indianapolis, Indiana. <https://peer.asee.org/20501>.
 11. Gregory J.S. Hickman, Kendrick Henderson, Martin R. Parker, Kuang-Ting Hsiao. "QUANTITATIVE DISPERSION QUALITY ANALYSIS OF FIBROUS CARBON NANOFILLERS USING ELECTRIC FIELD ALIGNMENT." Proceedings of SAMPE 2013 (Society of the Advancement of Material and Process Engineering), Long Beach, CA, May 6-9, 2013.
 12. Erin E. McDonald, Landon F. Wallace, Gregory J.S. Hickman, Kuang-Ting Hsiao. "MANUFACTURING AND CHARACTERIZATION OF CARBON NANOFIBER MODIFIED CYCOM 5320 T40/800 CFRP WITH OUT-OF-AUTOCLAVE-VACUUM-BAG-ONLY (OOA-VBO) PROCESS." Proceedings of SAMPE 2013 (Society of the Advancement of Material and Process Engineering), Long Beach, CA, May 6-9, 2013.
 13. Jefferson, G. D., & Steadman, S. J., & Thomas, T. G., & Hsiao, K. (2013, June), Novel Program for Engineering Student Retention Paper presented at 2013 ASEE Annual Conference & Exposition, Atlanta, Georgia. <https://peer.asee.org/22317>.
 14. Kuang-Ting Hsiao, "Embedded carbon fiber sensor for NDE in carbon fiber reinforced plastic (CFRP) laminate composite," Proceedings of SAMPE Tech 2012 Conference, Charleston Convention Center, North Charleston, SC, October 22-25, 2012.
 15. Gregory J.S. Hickman, Landon F. Wallace, Valerie A. Burks, Kuang-Ting Hsiao, "Effects of carbon nanofiber reinforcements in adhesive bonding of CFRP," Proceedings of SAMPE 2012 (Society of the Advancement of Material and Process Engineering), Baltimore, MD, May 21-24, 2012.
 16. Kuang-Ting Hsiao, Basil I. Farah, Peter H. Wu, Ming C. Liu, "Mode-I delamination characterization of composite using CNF-modified epoxy/carbon fiber prepreg," Proceedings of SAMPE 2012 (Society of the Advancement of Material and Process Engineering), Baltimore, MD, May 21-24, 2012.
 17. Kuang-Ting Hsiao, Basil I. Farah, Landon F. Wallace, Dongyeon Lee, Hareesh Tippur, "Processing and fracture behavior of carbon nanofiber modified CFRP via OOA-VBO process," Proceedings of SAMPE 2012 (Society of the Advancement of Material and Process Engineering), Baltimore, MD, May 21-24, 2012.
 18. Gail D. Jefferson, Michael L. Hempowicz, Erin E. McDonald, Landon F. Wallace, Basil I. Farah, Kuang-Ting Hsiao, "Hygrothermal aging characterization of CNF-modified glass fiber/polyester composite manufacturing with VARTM," Proceedings of SAMPE 2012

(Society of the Advancement of Material and Process Engineering), Baltimore, MD, May 21-24, 2012.

19. Peter J. Sakalaukus Jr., Andrew Mosley, Basil I. Farah, Kuang-Ting Hsiao, “Thermal conductivity characterization of nano-enhanced paraffin wax,” Proceedings of the ASME 2011 International Mechanical Engineering Congress & Exposition (IMECE2011), Denver, Colorado, November 11-17, 2011. (paper number: IMECE2011-65070)
20. Kuang-Ting Hsiao, Basil I. Farah, Peter H. Wu, Ming C. Liu, “Carbon nanofibers enhanced resin film for out-of-autoclave composite laminate,” Proceedings of SAMPE 2011 (Society of the Advancement of Material and Process Engineering), Long Beach, CA, May 23-26, 2011.
21. Joseph A. Stewart, Kuang-Ting Hsiao, Martin R. Parker, “Electric Field Alignment of CNF in EPON 862 Epoxy Resin,” Proceedings of SAMPE 2011 (Society of Advancement of Material and Process Engineering), Long Beach, CA, May 23-26, 2011.
22. Kai Jin Teoh, Kuang-Ting Hsiao, “Residual stress modeling of a curve-shaped composite part manufactured with vacuum assisted resin transfer molding and multistage-curing technique,” Proceedings of SAMPE 2011 (Society of the Advancement of Material and Process Engineering), Long Beach, CA, May 23-26, 2011.
23. Robert L. Clark III, Kuang-Ting Hsiao, Martin R. Parker, “Rheological Characteristics of Nanofiber Enhanced Epoxy Resin Viscosity,” Proceedings of SAMPE 2011 (Society of the Advancement of Material and Process Engineering), Long Beach, CA, May 23-26, 2011.
24. G.J. Hickman and K.T. Hsiao, “Finite element analysis of bonded composite single-lap joint as a basis for optimizing future nano-reinforcement configurations,” ASME Early Career Technical Journal, 2010 ASME Early Career Technical Conference, ASME ECTC, Atlanta, GA, October 1–2, 2010.
25. Basil I. Farah, Gail D. Jefferson, Kuang-Ting Hsiao, “Water absorption of carbon nanofiber enhanced polyester/ e-glass composite materials,” ASME Early Career Technical Journal, 2010 ASME Early Career Technical Conference, ASME ECTC, Atlanta, GA, October 1 – 2, 2010.
26. M. Hempowicz, G. Jefferson, K-T Hsiao, N. Gaston, S. Ramsey, G. Hickman, “An Experimental Study for Flexural Properties of 22- and 32-ply Honeycomb Composite Panels IM7/8552,” ASME Early Career Technical Journal, 2010 ASME Early Career Technical Conference, ASME ECTC, Atlanta, GA, October 1 – 2, 2010.
27. Kai Jin Teoh and Kuang-Ting Hsiao, “Does the multiple curing stage approach reduce the spring-in angle of a curve-shaped composite laminate? A comprehensive study of experiments and modeling,” Proceedings of SAMPE 2010 conference, Seattle, WA, USA, May 17-20, 2010.
28. Kai Jin Teoh and Kuang-Ting Hsiao, “Spring-in prediction for cylindrical specimens manufactured with VARTM,” SAMPE Fall Technical Conference, Wichita, KS, USA, October 19-22, 2009.
29. Kuang-Ting Hsiao, James Ryals, Peter H. Wu, Ming C. Liu, “Carbon nanofibers toughened AS-4/Epon862 prepreg and its laminate properties,” SAMPE Fall Technical Conference, Wichita, KS, USA, October 19-22, 2009.
30. Kai Jin Teoh and Kuang-Ting Hsiao, “Investigation on the spring-in behavior of curved composite parts manufacturing with VARTM,” Proceedings of SAMPE 2009 conference, Baltimore, MD, USA, May 18-20, 2009.

31. Robert L. Clark III, Nathan Brock and Kuang-Ting Hsiao, "Experimental Investigation on Viscosity-Temperature Relationship of CNFs Filled Epoxy," ICCE-17, July 26-August 1, 2009. Honolulu, HI, USA. Proceedings published in World Journal of Engineering Vol.6 Supplement 2009 P163, <http://wjoe.hebeu.edu.cn/mulu.sup.2009.htm>.
32. Kuang-Ting Hsiao, James Ryals, Peter H. Wu, Ming C. Liu, "Mechanical property characterization of multiscale carbon fibers and carbon nanofibers reinforced polymer matrix composite," Proceedings of IMECE 2009, 2009 ASME International Mechanical Engineering Congress & Exposition, Lake Buena Vista, FL, USA, November 13-19, 2009. (paper number: IMECE2009-12937).
33. Kazuhiro Mori, Kuang-Ting Hsiao, "Embedded carbon fiber sensor for monitoring the residual strain development during an exothermal polymer matrix composite manufacturing process," Proceedings of IMECE 2008, 2008 ASME International Mechanical Engineering Congress and Exposition, Boston, MA, USA, October 31 – November 6, 2008. (paper number: IMECE2008-67600)
34. Robert L. Clark III, Michael Skinner, Basil Farah, Justin Farris, Kuang-Ting Hsiao, and Martin R. Parker, "Thermal and Electrical Conductivities Characterization of CNF-Modified Glass Fiber/Polyester Composite," Proceedings of SAMPE 2008 conference, Long Beach, CA, May18-22, 2008.
35. Vishwanath R. Kedari and Kuang-Ting Hsiao, "Experimental characterization of void fraction of polyester/E-glass fiber composites manufactured with VARTM process," Proceedings of SAMPE 2008 conference, Long Beach, CA, May18-22, 2008.
36. Kuang-Ting Hsiao, "Numerical investigation on matrix residual stress development of polymeric composites manufactured with resin transfer molding process," Proceedings of SAMPE Fall Technical Conference 2007, Cincinnati, OH, October 29-November 1, 2007.
37. Khoa Lu, Basil Farah, Kuang-Ting Hsiao, Martin R. Parker, "Mode-I interlaminar fracture toughness and fatigue crack growth of carbon nanofibers modified polyester/glass fiber laminates," Proceedings of IMECE2007, 2007 ASME International Mechanical Engineering Congress and Exposition, Seattle, WA, USA, November 11-15, 2007. (paper number: IMECE2007-42116).
38. Kuang-Ting Hsiao, "Uncertainty modeling of residual stress development in polymeric composites manufactured with resin transfer molding process," Proceedings of IMECE2007, 2007 ASME International Mechanical Engineering Congress and Exposition, Seattle, WA, USA, November 11-15, 2007. (paper number: IMECE200742226).
39. Kuang-Ting Hsiao, "Numerical investigation of the significance of real-time cure kinetics characterization and control in resin transfer molding," Proceedings of SAMPE 2007, Baltimore, MD, USA, June 3-7, 2007.
40. K.T. Hsiao, P. Gadalla, F.M. Donovan Jr., "Electrical Resistivity Characterization and Modeling of Carbon Nanofiber-Polymer Suspension," Proceedings of IMECE2006, 2006 ASME-International Mechanical Engineering Congress and Exposition, Chicago, IL, USA, November 5-10, 2006. (paper number: IMECE2006-14466).
41. Sudhir Gangireddy, Kuang-Ting Hsiao, "Enhancement of Dimensional Stability of Polymer Composites Manufacturing Using Carbon Nanofibers," Proceedings of IMECE2005, 2005 ASME International Mechanical Engineering Congress and Exposition, Orlando, FL, USA, November 5-11, 2005. (paper number: IMECE200580619).

42. Kuang-Ting Hsiao, "A Numerical Study of Integrated Direct Cure Kinetics Characterization and Control for Resin Transfer Molding (RTM)," Proceedings of IMECE2005, 2005 ASME International Mechanical Engineering Congress and Exposition, Orlando, FL, USA, November 5-11, 2005. (paper number: IMECE200580669).
43. Alejandro Rodriguez, Bob Minaie, Omar Restrepo, Kuang-Ting Hsiao, "Optimization of Spine Sensor Location in RTM," Proceedings of IMECE2005, 2005 ASME International Mechanical Engineering Congress and Exposition, Orlando, FL, USA, November 5-11, 2005. (paper number: IMECE2005-81798).
44. Kuang-Ting Hsiao, Rex Little, Omar Restrepo, Bob Minaie, "Direct Cure Characterization During Vacuum Assisted Resin Transfer Molding," Proceedings of 50th International Society for Advancement of Material and Process Engineering (SAMPE) Symposium and Exhibition, Long Beach, CA, USA, May 1-5, 2005.
45. Ramin Sadeghian, Sudhir Gangireddy, Bob Minaie, Kuang-Ting Hsiao, "Mode-I Delamination Characterization for Carbon Nanofibers Toughened Polyester/Glassfiber Composites," Proceedings of 50th International Society for Advancement of Material and Process Engineering (SAMPE) Symposium and Exhibition, Long Beach, CA, USA, May 1-5, 2005.
46. Omar Restrepo, Alejandro Rodriguez, Kuang-Ting Hsiao, Bob Minaie, "Adaptive Flow Control of RTM Using Spinal Sensor," Proceedings of 50th International Society for Advancement of Material and Process Engineering (SAMPE) Symposium and Exhibition, Long Beach, CA, USA, May 1-5, 2005.
47. K.-T. Hsiao, "A Numerical Study of Online Cure Kinetics Characterization During Liquid Composite Molding", The 7th International Conference on Flow Processes in Composite Materials (FPCM), Newark, DE, USA, July 7-9, 2004.
48. B. Minaie, W. Li, S. Jiang, K. Hsiao, R. Little "Adaptive Control of Non-Isothermal Filling in Resin Transfer Molding", Proceedings of 49th International Society for Advancement of Material and Process Engineering (SAMPE) Symposium and Exhibition, Long Beach, CA, May 16-20, 2004.
49. J. Gou, S. L. Jiang, B. Minaie, K. T. Hsiao, Z.Y. Liang, C. Zhang, and B. Wang, "Load Transfer in Single-Walled Carbon Nanotube Rope/Polymer Nanocomposites," Proceedings of the 49th International Society for Advancement of Material and Process Engineering (SAMPE) Symposium and Exhibition, Long Beach, CA, May 16-20, 2004.
50. J.M. Lawrence, P. Simacek, A. Gokce, K.T. Hsiao, S.G. Advani, "From Simulation to Production: Intelligent Manufacturing of Composite Components with Resin Transfer Molding Process," Proceedings of 49th International SAMPE Symposium and Exhibition, Long Beach, CA, May 16-20, 2004.
51. O. Restrepo, K.T. Hsiao, S. Jiang, B. Minaie, "Preliminary Study and Implementation Of Adaptive Control For Resin Transfer Molding," ASME Southeastern Region XI2004 Regional Technical Conference, Vol. 3, No. 1, pp. 8.1-8.6, Mobile, AL, April 2&3 2004.
52. C. Myint, K.-T. Hsiao, B. Minaie, "Review of Manufacturing Functionally Graded Materials," ASME Southeastern Region XI2004 Regional Technical Conference, Vol. 3, No. 1, pp 6.1-6.6, Mobile, AL, April 2&3 2004.
53. M. Devillard, K.T. Hsiao, S.G. Advani, "Validation and implementation of control strategies for liquid composite molding processes," 2003 ASME International Mechanical

- Engineering Congress and R&D Expo Washington D.C., USA, November 15-21, 2003 (paper number: IMECE2003-43521).
54. M. Devillard, A. Gokce, K.-T. Hsiao, S. G. Advani, "Addressing flow variations due to imperfect fit between preform edges and the mold walls in resin transfer molding processes," TEXCOMP-6 The international conference on Textile Composites, Philadelphia, PA, September 11-14, 2002.
 55. Mathieu Devillard, Kuang-Ting Hsiao, Suresh G. Advani, "An Approach To Automate Sensing And Control Of Mold Filling In The Resin Transfer Molding Process," 2002 ASME-IMECE, New Orleans, LA, November 17-22, 2002.
 56. K.-T. Hsiao, M. Devillard, S.G. Advani, "Streamlined Intelligent RTM Processing: From Design to Automation," Proceedings of 47th International SAMPE Symposium and Exhibition, Vol. 47, pp. 454-465, Long Beach, CA, May 12-16, 2002.
 57. V. Antonucci, M. Giordano, K.-T. Hsiao, S. G. Advani, "A Model for Cure Control During the Resin Transfer Molding Process," Proceeding of the American Society for Composites, 16th Technical Conference, Blacksburg, VA, September 9-12, 2001.
 58. J. M. Lawrence, K.-T. Hsiao, R. C. Don and S. G. Advani, "Use of a Design and Control Methodology to Manufacture Complex Composite Parts by Manipulating Flow during Resin Transfer Molding Process," Proceedings of 46th SAMPE International Symposium and Exhibitions, Vol. 46, pp. 286-299, Long Beach, CA, May 6-10, 2001. 48. A Gokce, K.-T. Hsiao, and S. G. Advani, "A method to find auxiliary injection gate locations for successful mold filling in Resin Transfer Molding Process," Proceedings of 46th SAMPE International Symposium and Exhibitions, Vol. 46, pp. 310-325, Long Beach, CA, May 6-10, 2001.
 59. K.-T. Hsiao and S. G. Advani, "Investigation of Heat Transfer during Laminar flow of Incompressible Liquid through Periodic Porous Media," Proceedings of 4th ISHMT/ASME Heat and Mass Transfer Conference, Pune, India, January, 2000. 50. S. G. Advani, K.-T. Hsiao, and Hans S. Laudorn, "Significance of Heat Dispersion in Resin Transfer Molding Process" Proceedings of the 8th U.S.–Japan Conference on Composite Materials, pp. 87-104, Baltimore, MD, September 24-25, 1998.
 60. 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.

CONFERENCE PRESENTATIONS

1. Presenter at CAMX 2018 Conference, Dallas, TX, October 15-18, 2018.
2. Presenter at SAMPE 2018 Conference, Long Beach, CA, May 21-24, 2018.
3. Presenter at CAMX 2016 Conference, Anaheim, CA, September 26-29, 2016.
4. Presenter at SAMPE 2015 Conference, Baltimore, MD, May 18-22, 2015.
5. Presenter at SAMPE 2013 Conference, Long Beach, CA, May 6-9, 2013.
6. Presenter at SAMPE Tech 2012 Conference, Charleston Convention Center, North Charleston, SC, October 22-25, 2012.

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

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2. Invited speaker at the Department of Naval Architecture and Ocean Engineering, National Taiwan University, Taipei, Taiwan, December 22, 2000.

COURSES TAUGHT

I have taught many courses for undergraduate-level covering different subjects. For graduate level, my teaching has been limited in thermos-fluidic related courses and composite materials related courses. Contemporary research centric subjects have been offered in directed independent study courses, projects, or theses for capable senior undergraduate students and graduate students.

Undergraduate courses

ME-135 Engineering Graphics and Comm.
EG-284 Dynamics
ME-228 Mechanical Engineering Analysis I
ME-328 Mechanical Engineering Analysis II
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 regular lecture/lab courses in Fall and Spring semesters. Research/creative courses for individual students such as Directed Independent Study courses, Doctoral dissertation, MS thesis, MS project, and summer courses are not included in the list.

It has been a major job satisfaction of seeing my research graduate students' career successes. In my group, everyone has been able to grow different skill sets along with his/her personality and selected research areas under a creative and encouraging teamwork atmosphere. Our alumni are able to apply their technical, management/coordination, and interpersonal skills during their career path. The alumni of my research group are working for variety of employers including NASA, US-Army Flight Testing Center, Rolls-Royce, Boeing, Corning, Airbus, Honda (Japan), Petroleum, Renewable Fuel, and Specialty Piping/Vessel Manufacturing Industry.

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 (2010, 2011, 2012, 2013, 2014, 2015)
5. Member of College of Engineering Faculty Affairs Committee (Fall 2011-Summer 2015)
6. Chair of Faculty Affairs Committee (Fall 2014-Summer 2015)
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 Faculty Affairs Committee (Fall 2013-Spring 2014)
11. Member of Promotion and Tenure Committee (Fall 2015-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)
3. Member of Mechanical Engineering Faculty Search Committee (Fall 2010-Summer 2011)
4. Member of Mechanical Engineering Faculty Search Committee (Fall 2013-Summer 2014)
5. Member of Mechanical Engineering Faculty Search Committee (Fall 2014-Summer 2015)
6. Member of Mechanical Engineering Faculty Search Committee (Fall 2015-Summer 2016)

7. Chair of Mechanical Engineering Tenure and Promotion Committee (Fall 2014-Summer 2015)
8. Departmental Library Representative (Fall 2014-present)
9. Special Service or Assignment:
 - Lab Director of ME-department's Materials Research Laboratory (EGCB 130) (Fall 2004-Summer 2012)
 - Lab Director of ME-department's Composite Materials Research Laboratory (Shelby Hall room 1323) (Summer 2012-present)

Students Thesis Committee:

- Chair of MS Thesis or D.Sc. Dissertation Committee for:
 - Sudhir Gangireddy (MS-ME, Dec 2005)
 - Vishwanath R Kedari (MS-ME, July 2008)
 - Kazuhiro Mori (MS-ME, August 2008)
 - Kai Jin Teoh (MS-ME, December 2009)
 - Robert Clark III (MS-ME May 2010)
 - Peter Sakalaukus (MS-ME, Aug 2011)
 - Gregory Hickman (MS-ME, Summer 2013)
 - Landon Wallace (MS-ME, Fall 2012)
 - Anusha Rudraraju (MS-ME, Fall 2012)
 - Andrew Mosley (MS-ME, Fall 2012)
 - Basil Farah (MS-ME, Fall 2012)
 - Nathan Brock (MS-ME, Summer 2014)
 - Erin McDonald (MS-ME, Summer 2014)
 - John Brewer (MS-ME, Spring 2015)
 - Alexander Scruggs (D.Sc. of System Engineering, Spring 2017 expected)
 - Bikash Ranabhat (D.Sc. of System Engineering, Summer 2016-Spring 2019 expected).
 - Fariborz Bayat, (MS-ME student, Summer 2016-Fall 2017 expected))
 - Sebastian Kirmse, (MS-ME student, Summer 2016-Spring 2017 expected)
- Chair of MS Research Project Committee for:
 - Omar Restrepo (MS-ME, Dec 2005)
- Chair of University Honor BS Thesis Committee for:
 - David Conner Denton, (BS-ME, May 2016).
- Member of MS Thesis Committee for:
 - Sang-Min Hong (MS-ME, Dec 2005; Thesis Committee Chair: Dr. A.-V. Phan,)
 - Tarek Al-Saadi (MS-ECE, Fall 2006; Thesis Committee Chair: Dr. M.R. Parker)
 - Praneeth Sivapuram (MS-ME Spring 2008, Thesis Committee Chair: Dr. A.-V. Phan)

- Justin Farris (MS-ECE, Spring 2008; Thesis Committee Chair: Dr. M.R. Parker,)
- Aaron Chen (MS-ECE, Fall 2008, Thesis Committee Chair: Dr. S.H. Russ) 6. Vinay Kumar Vadlamudi (MS-CHE, Dec 2008, Thesis Committee Chair: Dr. S. Palanki)
- Basil Farah (MS-ECE, Spring 2009, Thesis Committee Chair: Dr. M.R. Parker)
- Shali Vemparala (MS-CHE, Fall 2009, Thesis Committee Chair: Dr. S. Palanki)
- Krishna Priya Ayalasomayajula (MS-CHE, June 2010, Thesis Committee Chair: Dr. S. Palanki)
- Colomb, Matthias A., (D.Sc. System Engineering, May 2016, Dissertation Committee Chairs: Nicholas Sylvester and Srinivas Palanki)

Extracurricular Activities:

- ACE (Accepting the Challenge to Excel) (Fall 2004, Fall 2005, Fall 2006, Fall 2007)
- Advisor of Pi Tau Sigma (2007-present)
- 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 E² 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

Conference Organizer/Chair

1. Co-chair for RTM session in the 7th International Conference on Flow Processes in Composite Materials (FPCM7), Newark, DE, USA, July 7-9, 2004.
2. 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.
3. Symposium co-organizer and session co-chair of Nanocomposites Symposium for ASME-IMECE2007 conference, Seattle, WA, USA, November 10-16, 2007.
4. Symposium co-organizer and session co-chair of Nanocomposites Symposium for ASME-IMECE2008 conference, Boston, MA, USA, Oct 31- Nov 6, 2008.
5. Symposium co-organizer and session co-chair of “nanocomposites” 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.
6. Session co-chair at SAMPE 2009 Technical Fall Conference, Wichita, KS, USA, Oct 19-22, 2009.

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

Reviewer for Journal Articles and Conference Papers and Research Proposals

- Composites Part A: Applied Science and Manufacturing
- Composites Part B: Engineering
- Composite Structures
- Composites Science and Technology
- 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
- Panelist and reviewer of NSF proposals review
- Panelist of Michigan 21st Century Jobs Fund proposal review
- Proposal Reviewer of ACS Petroleum Research Fund
- Reviewer for book proposal for John Wiley & Sons.
- Proposal Reviewer of National Research Foundation in South Africa
- Proposal Reviewer for Louisiana State’s Board of Regents
- Serve on the Editorial Review Board for Scientific Journals International (SJI)
- Serve on the Editorial Board of ISRN Mechanical Engineering
- 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)

Invited External Examiner for Ph.D. Thesis

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