Commit to excellence in teaching
Engage in multidisciplinary scholarly research
Develop externally funded research programs and center of excellence

Curriculum Vitae

William W. Liou

Education

Ph.D.	1991	Aerospace Engineering, The Pennsylvania State University
M.S.	1987	Aerospace Engineering, The Pennsylvania State University
B.S.	1982	Aeronautics and Astronautics, National Cheng-Kung University, Taiwan

Awards and Honor

Western Michigan University Excellence in Discovery – 2016
  Research and external funding over $1 million level for 5 years 2010-2015 (as a Principal Investigator)

Barnes W. McCormick Honorary Lecture – 2016
  Aerospace Engineering Department, The Pennsylvania State University, 28 March 2016.

Western Michigan University Excellence in Discovery – 2015
  Research and external funding over $1 million level for 5 years 2009-2014 (as a Principal Investigator)

Distinguished Alumni Award – 2012
  Department of Aeronautics and Astronautics, National Cheng-Kung University, Taiwan

Distinguished University Faculty Scholar - 2009
  The highest honor Western Michigan University bestows on its faculty members. Established in 1978, the honor recognizes those whose work constitutes a significant body of achievement and is widely recognized beyond the University.

National Nuclear Security Administration Defense Programs Award of Excellence - 2004
  Awarded by the National Nuclear Security Administration, U.S.A
  Citation: Successfully predicting performance of narrow-band re-entry radars in the presence of high-velocity plasma.

Employment History

Western Michigan University

August 2020 - present	Professor and Chair, Mechanical and Aerospace Engineering Department, College of Engineering and Applied Sciences
2004 - present	Professor, Mechanical and Aerospace Engineering Department, College of Engineering and Applied Sciences
1999 - present	Founding Director, Gas Turbine Engine Test Cell, Mechanical and Aerospace Engineering Department, College of Engineering and Applied Sciences
1997 - present	Founding Director, Computational Engineering Physics Lab, Mechanical and Aerospace Engineering Department, College of Engineering and Applied Sciences
2010 - 2012	Founding Director, CAViDS Hybrid Electric Applied Research (CHEAR) Laboratory, College of Engineering and Applied Sciences

2007 - 2012	Founding Director, CAViDS Consortium, College of Engineering and Applied Sciences
2005 - 2012	Founding Director, Center for Advanced Vehicle Design and Simulation (CAViDS), College of Engineering and Applied Sciences
1999 - 2004	Associate Professor, Mechanical and Aerospace Engineering Department, College of Engineering and Applied Sciences
1997 - 1999	Assistant Professor, Mechanical and Aerospace Engineering Department, College of Engineering and Applied Sciences

UNIT, Inc.

1996 - 1998	Program Manager

NASA Glenn Research Center

2000	NASA/ASME Summer Faculty, Internal Fluid Mechanics Division
1991 -1996	Research Associate, Institute for Computational Mechanics in Propulsion, Internal Fluid Mechanics Division

Professional Honors and Appointments

- Associate Fellow, American Institute of Aeronautics and Astronautics (AIAA)
- Editorial Board, Journal of Cardiovascular Disorder, 2016-present
- Editorial Board, International Journal of Aerospace Engineering, 2010-present
- Executive Board, Center for high Performance Computing and Big Data, WMU, 2014-present
- Editorial Advisory Board, Journal of Aircraft, 2008-2013
- A 2007 Innovation Michigan Award Finalist. Business Review of Western Michigan
- Who's Who in Academia, News Digest International

1. DEVELOPMENT EXPERIENCE

Entrepreneurship Development

Principal Investigator, Western Michigan University I-Corps Program. 2015.

Research Center of Excellence Development

Center for Advanced Vehicle Design and Simulation (CAViDS)
Founding Director. 2005-2012

Founding Director (2010-2012). CAViDS Hybrid Electric Applied Research (CHEAR) Laboratory.

Academic Laboratory Development

Computational Engineering Physics Lab
Founding Director. 1997 – present

Gas Turbine Engine Test Cell
Founding Director. 1999- present

Academic New Course Development

- Biofluid Mechanics: from Earth to Space (AE 6200) – 2017
- Electric Hybrid Vehicle Fundamentals (ME 5950) – 2011
- Hydrodynamics Stability (ME 5950/ME 6950) – 2000
- Microfluid Mechanics (ME 5950/ME 6950) – 2004
- Turbulence (ME 6350) – 2004

Post-Doctoral Students Development

7. Dr. Jin Xu   2019 – 2021, Computational simulations of oil churning loss in ground vehicles. Ventricular cerebrospinal fluid flow and brain motion.

6. Dr. Yang Yang   2008 – 2019, Blast wave fluid structure interactions, Multiphysics vehicle power train and drive train simulations. Biomechanics of human heart valve implant, shoulder implant, and ventricular cerebrospinal fluid flow and brain.

5. Dr. Yan Zhang   2013 – 2015, Blood circulation system simulator.

4. Dr. Phuriwat Anusonti-Inthra
                               2010 – 2012, Cyclonic particle separation. Engine cooling.

3. .Dr. Meng-Huang Lu   2008 – 2010, Large-Eddy-Simulations of flow over rough wall

2. Dr. Yichuan Fang   2003 – 2004, Laminar breakdown using direct simulation Monte Carlo method.

1. Dr. Fengjun Liu   2002 – 2003, Simulations of flow transition over underwater bodies.

Graduate Students Development

Ph.D. Dissertation Directed

8. *Accumulation of Polar Vorticity on Giant Planets; Towards a Three-Dimensional Theory*
         Dr. Shawn Brueshaber. 2020.

7. *A Direct Forcing and Heating Immersed Boundary-Lattice Boltzmann Method for Arterial Wall Thermography*
         Dr. Oluyinka Olugbenga Bamiro. 2011.

6. *Analytical, Computational and Experimental Studies of Capillary Flow in Complex Geometries*
         Dr. Yongquing Peng. 2009. Co-advised with Dr. Peter Parker of Paper Engineering, Chemical Engineering, & Imaging Department at WMU.

5. *Modeling Fluid Structure Interaction over A Fin Attached to A NACA0012 Airfoil*
         Dr. Srinivasa Pantula. 2008

4. *Atomistic-Based Finite Element Simulation of Carbon Nanotubes*
         Dr. Yang Yang. 2008.

3. *A New Rough Wall Layer Modeling for Turbulent Flows Using the Brinkman Equation*
         Dr. Meng-Huang Lu. 2008.

2. *Parallel Simulation of Microflows by DSMC and Burnett Equations*
         Dr. Yichuan Fang. 2003.

1. *Numerical Studies of Transition for Flows around Multi-Element Airfoils*
         Dr. Fengjun Liu. 2002.

Master's Thesis Directed

3. *Computational Analysis of a Wing Oscillator*
     Ryne Radermacher. 2012.

2. *Biofuel Characteristics in Micro Turbojet Application*
     Ing Huang Tan. 2012.

1. *A K-Epsilon Extension for Wall-Bounded Flows on a Broadband Aeroacoustics System Simulator*
     David R. Gonzalez. 2006.

Multidisciplinary Research Development

Build externally funded research programs. Develop graduate student researchers and post-doctoral researchers. Develop computing hardware, including computer workstations and computer clusters.

Basic Research

- *Big data Analytics for fire and smoke prediction*

- *Computational medical engineering*

- *Computational nano-mechanics*

- *Continuum fluid dynamics*

- *Microfluid dynamics*

- *Parallel computing*

Applied Research

- *Ground vehicle simulations*

Research in Green Energy

Patents Applied

- Magnetic-Particle-Based Wind Power Generator Without Moving Parts, provisional patent

- Wireless Monitoring System and Communication Device for Blood Glucose Monitoring, provisional patent

- Aeroship, provisional patent

2. AWARDED CASH RESEARCH GRANTS & CONTRACTS

Basic Research

Title:	*Explore Impacts of Head Motion on Cerebrospinal Fluid Flow Dynamics using Simulation and Real-Time Medical Imaging*
Role:	Principal Investigator
Sies of Performance:	Western Michigan University and Juntendo University Hospital (Japan)
Funding Agency:	National Science Foundation (NSF)
Period:	2022-2024

Title:	*Hearing and Vision Loss in the Aging Population: From Molecules to Society*
Role:	Co-Principal Investigator
Sies of Performance:	Western Michigan University
Funding Agency:	Western Michigan University
Period:	2022-2023

Title:	*Turbulent Ventricular Cerebrospinal Fluid Flow Dynamics in Physiological and Pathological Conditions*
Role:	Principal Investigator
Sies of Performance:	Western Michigan University and Juntendo University Hospital (Japan)
Funding Agency:	National Science Foundation (NSF)
Period:	2017-2020

Title:	*Fire Safety in Smart Building – Big Data Analytics for Fire and Smoke Prediction*
Role:	Principal Investigator
Site of Performance:	Western Michigan University
Funding Agency:	Georgeau Construction Research Center
Period:	2018-2019

Title:	*Fire Safety in Smart Building – 4D Fire and Smoke Simulation*
Role:	Principal Investigator
Site of Performance:	Western Michigan University
Funding Agency:	Georgeau Construction Research Institute
Period:	2017-2018

Title:	*WMU/Borgess Clinically Motivated Cardiovascular Simulation Research*
Role:	Principal Investigator
Sites of Performance:	Western Michigan University and Borgess Heart Research Institute
Funding Agencies:	Western Michigan University and Borgess Heart Research Institute
Period:	2013-2014

Title:	*Physics-Based Wall Layer Modeling for Large Eddy Simulation of Flows over Rough Wall*
Role:	Principal Investigator
Site of Performance:	Western Michigan University
Funding Agency:	Office of Naval Research (ONR) of the U.S. Navy
Period:	2008-2011

Title:	*Analytical, Computational and Experimental Studies of Capillary Flow in Complex Geometries*
Role:	Principal Investigator
Sites of Performance:	Western Michigan University
Funding Agencies:	Proctor and Gamble
Period:	2007-2009

Title:	*Airfoil/Wing Flow Control Using Flexible Extended Trailing Edge*
Role:	Co-Principal Investigator
Sites of Performance:	Western Michigan University and NASA Langley Research Center
Funding Agency:	Air Force Office of Scientific Research (AFOSR) of the U.S. Air Force
Period:	2006-2008

Title:	*New Rough Wall Layer Modeling Using the Brinkman's Equation*
Role:	Principal Investigator
Site of Performance:	Western Michigan University
Funding Agency:	Office of Naval Research (ONR) of the U.S. Navy
Period:	2005-2008

Title:	*Simulations of Flow Transition over Underwater Bodies*
Role:	Principal Investigator
Site of Performance:	Western Michigan University
Funding Agency:	Office of Naval Research (ONR) of the U.S. Navy
Period:	2003

Title:	*DSMC Simulations of Laminar Flow Breakdown on Space Transport Systems*
Role:	Principal Investigator
Sites of Performance:	Western Michigan University and GAB Consulting Pty Ltd. (Australia)
Funding Agency:	NASA Langley Research Center
Period:	2001-2003

Title:	*Unified LES/RANS Approach Using Conservation Element and Solution Element Method*
Role:	Principal Investigator
Site of Performance:	Western Michigan University
Funding Agency:	NASA Glenn Research Center
Period:	2001

Title:	*MEMS Flow and Heat Transfer Simulations*
Role:	Principal Investigator
Site of Performance:	Western Michigan University
Funding Agency:	Michigan Space Grant Consortium
Period:	2000

Title:	*Bursting Frequency Prediction in Turbulent Boundary Layers*
Role:	Principal Investigator
Site of Performance:	Western Michigan University
Funding Agency:	Sandia National Laboratories of the U.S. Department of Energy
Period:	1999-2002

Title:	*Calculation of the Flow Transition and Separation over Two-Dimensional Multi-Element Airfoil*
Role:	Principal Investigator
Site of Performance:	Western Michigan University
Funding Agency:	NASA Langley Research Center
Period:	1998-2000

Applied Research

Title:	*Oil Churning Loss Simulations*
Role:	Principal Investigator
Site of Performance:	Western Michigan University
Funding Agency:	CAViDS Consortium (Caterpillar Inc., DANA Inc., Eaton Corp., Lubrizol)
Period:	2016-present

Title: *Hydraulic Torque Converter Efficiency Simulations*
Role: Principal Investigator
Site of Performance: Western Michigan University
Funding Agency: CAViDS Consortium (Caterpillar Inc., Lubrizol)
Period: 2015-2017

Title: *Reverse Shoulder Arthroplasty (RSA) Modeling*
Role: Principal Investigator
Sites of Performance: Western Michigan University and Cleveland Clinic
Funding Agency: Exactech, Inc.
Period: 2014-2017

Title: *Fluid/Structure Interactions of a Mixing Element*
Role: Principal Investigator
Site of Performance: Western Michigan University
Funding Agency: CAViDS Consortium (Caterpillar Inc.)
Period: 2014-2015

Title: *Fluid/Structure Interactions of a Hydraulic Line*
Role: Principal Investigator
Site of Performance: Western Michigan University
Funding Agency: CAViDS Consortium (Caterpillar Inc.)
Period: 2014-2015

Title: *Fluid/Structure Interactions of a Fan Test Facility*
Role: Principal Investigator
Site of Performance: Western Michigan University
Funding Agency: CAViDS Consortium (Caterpillar Inc.)
Period: 2014-2015

Title: *Assessment of OpenSource Computational Fluid Dynamics Codes*
Role: Principal Investigator
Site of Performance: Western Michigan University
Funding Agency: CAViDS Consortium (Caterpillar Inc., Eaton Corp., Lubrizol)
Period: 2013

Title: *Heat Transfer and Cooling Fluid Flow Simulations for Rotary Engine*
Role: Principal Investigator
Site of Performance: Western Michigan University
Funding Agency: CAViDS Consortium(Caterpillar Inc.)
Period: 2011-2013

Title: *Heat Transfer & Aerodynamics Flow Simulations for Vistronic Fan Drive*
Role: Principal Investigator
Site of Performance: Western Michigan University
Funding Agency: CAViDS Consortium(BorgWarner Inc.)
Period: 2011-2014

Title: *GPU and Cloud Computing Investigation*
Role: Principal Investigator
Site of Performance: Western Michigan University
Funding Agency: CAViDS Consortium(Caterpillar Inc., Eaton Corp., Lubrizol)
Period: 2011-2013

Title: *Fluid-Structure-Thermal Interactions of Exhaust Manifolds*
Role: Principal Investigator
Site of Performance: Western Michigan University
Funding Agency: CAViDS Consortium (Caterpillar Inc.)
Period: 2011-2012

Title: *CFD Simulation of Cooling Flows of CPS Heavy-Fuel Rotary Engine*
Role: Principal Investigator
Site of Performance: Western Michigan University
Funding Agency: CAViDS Consortium (L-3 Corp.)
Period: 2011-2012

Title: *Dynamics of Pneumatic Fan Drive Friction Liner*
Role: Principal Investigator
Site of Performance: Western Michigan University
Funding Agency: CAViDS Consortium (BorgWarner Inc.)
Period: 2011

Title: *Brake Fluid-Thermal Interaction Simulation*
Role: Principal Investigator
Site of Performance: Western Michigan University
Funding Agency: CAViDS Consortium (Caterpillar Inc.)
Period: 2011

Title: *Frictional Plate Wear*
Role: Principal Investigator
Site of Performance: Western Michigan University
Funding Agency: BorgWarner, Inc.
Period: 2010

Title: *Computational Simulations of Wind Turbine Extreme Aerodynamic Loading and Power Curve*
Role: Principal Investigator
Site of Performance: Western Michigan University
Funding Agency: Sepstar Inc.
Peroid: 2009-2010

Title: *Continuous monitoring Wireless and Communication Device for Blood Glucose*
Role: Co-Principal Investigator
Site of Performance: Western Michigan University
Funding Agency: WMU Research Foundation, OVPR Technology Development Fund, and the Michigan Initiative for Innovation and Entrepreneurship
Period: 2009

Title: *Aerothermal Simulations of the L-3 AVDS Engine Cooling Fan*
Role: Principal Investigator
Site of Performance: Western Michigan University
Funding Agency: CAViDS Consortium (Caterpillar Inc., Eaton Corp., Lubrizol)
Period: 2008

Title: *CFD of Air Flow in Automotive Intake Air Ducts*
Role: Principal Investigator

Site of Performance:	Western Michigan University
Funding Agency:	CAViDS Consortium (MANN+HUMMEL USA Inc.)
Period:	2007

Title:	*Simulations of Oil Flow in Heavy-Duty Tandem Axle*
Role:	Principal Investigator
Site of Performance:	Western Michigan University
Funding Agency:	CAViDS Consortium (Dana Corp)
Period:	2007

Title:	*Rocket Nozzle Plume Simulations using DSMC/Continuum Hybrid Methods*
Role:	Principal Investigator
Site of Performance:	Western Michigan University
Funding Agency:	Aerojet
Period:	2006

Developed and Managed Programs and Projects

Center for Advanced Vehicle Design and Simulation (CAViDS)

Title:	*Ground Vehicle Fatigue Modeling, Blast Wave Simulation, Sensor Data Analysis, and Structural Optimization for Reliability, Safety, and CBM*
Funding Agency:	Tank-Automotive Research, Development & Engineering Center (TARDEC), Research, Development and Engineering Command (REDCOM) of the U.S. Army
Role:	Principal Investigator
Period:	2009-2012
Personnel:	13 faculties from 3 engineering departments, numerous undergraduate and graduate students, post-docs, technicians.

Title:	*Fatigue Life Methodology*
Role:	Principal Investigator
Funding Agency:	Eaton Corporation
Period:	2011-2011

Title:	*Dual-Use Ground Vehicle Condition-Based Maintenance*
Role:	Principal Investigator
Funding Agency:	Tank-Automotive Research, Development & Engineering Center (TARDEC), Research, Development and Engineering Command (REDCOM) of the U.S. Army
Period:	2008-2011
Personnel:	8 faculties from 3 engineering departments; 5 graduate and 6 undergraduate students; technicians.

Title:	*Advanced Digital Hydraulic Hybrid Drive System. Phase III*
Role:	Principal Investigator
Funding Agency:	EATON Corporation, Hydraulic Division.
Period:	2010-2011
Personnel:	3 faculty from Mechanical and Aerospace Engineering; 1 post-doc. 1 graduate student; technicians.

Title: *Advanced Digital Hydraulic Hybrid Drive System. Phase II*
Role: Principal Investigator
Funding Agency: EATON Corporation, Hydraulic Division.
Period: 2009-2010
Personnel: 2 faculties from Mechanical and Aerospace Engineering; 1 research staff. 1 post-doc. 1 graduate student; technicians.

Title: *Dual-Use Ground Vehicle Reliability Prediction and Optimization, Tank Elastomer Pads Fatigue, and Vehicle Occupant Shock Wave Impact Load Prediction*
Role: Principal Investigator
Funding Agency: Tank-Automotive Research, Development & Engineering Center (TARDEC), Research, Development and Engineering Command (REDCOM) of the U.S. Army
Period: 2008-2010
Personnel: 5 faculties from 3 engineering departments; 2 post-doc. 5 graduate and 5 undergraduate students; technicians.

Title: *Heavy Truck Rollover Characterization – Phase III* B
Role: Principal Investigator
Funding Agency: National Transportation Research Center, Inc., Oak Ridge National Lab of the U.S. Department of Energy
Period: 2009
Personnel: 3 faculties from 3 engineering departments; 1 graduate and 3 undergraduate students.

Title: *Advanced Digital Hydraulic Hybrid Drive System*
Role: Principal Investigator
Funding Agency: Eaton Corporation
Period: 2008-2009
Personnel: 3 faculties from Mechanical and Aerospace Engineering; 1 post-doc. 2 graduates; technicians.

Title: *Heavy Truck Rollover Characterization – Phase III* A
Role: Principal Investigator
Funding Agency: National Transportation Research Center, Inc., Oak Ridge National Lab of the U.S. Department of Energy
Period: 2007-2008
Personnel: 3 faculties from 2 engineering departments; 1 graduate and 3 undergraduate students.

Title: *Simulation-Based Heavy-Duty Truck Structural Reliability Analysis, Track Pin Bushing Fatigue, and HMMWV Underbody Scanning*
Role: Principal Investigator
Funding Agency: Tank-Automotive Research, Development & Engineering Center (TARDEC), Research, Development and Engineering Command (REDCOM) of the U.S. Army
Period: 2007
Personnel: 8 faculties from 3 engineering departments; 8 graduate and 5 undergraduate students; technicians.

CAViDS Hybrid Electric Applied Research (CHEAR) Laboratory
Role: Principal Investigator
Funding Agency: Eaton Corp.
Period: 2010-2014
Personnel: 3 faculty investigators, 1 post-doc, research staff, numerous undergraduate students, and graduate students.

Research Equipment Development

Title: *MRI: Acquisition of a High-Performance Cluster for Multidisciplinary Computational Research*
Role: Co-Principal Investigator
Funding Agency: National Science Foundation (NSF)
Period: 2011-2016
Personnel: Four co-principal investigators and two graduate students.

Title: *High Performance Computing Cluster*
Role: Principal Investigator
Funding Agency: Tank-Automotive Research, Development & Engineering Center (TARDEC), Research, Development and Engineering Command (REDCOM) of the U.S. Army
Period: 2008

Title: *Cost-Effective Parallel Computational Mast*
Role: Co-Principal Investigator
Funding Agency: Western Michigan University
Period: 2001

Undergraduate Student Research

Title: *Multiplatform RC Aircraft*
Role: Mentor
Funding Sponsor: WMU ORI Undergraduate Award for Research and Creative Scholarship Excellence Award
Period: Spring 2023

Title: *Aerodynamics of Wind Loading on Building*
Role: Mentor
Funding Sponsor: WMU OVPR Undergraduate Research Excellence Award
Period: Spring 2020

Title: *Land, Air, Surface, and Submarine Unmanned Aerial System*
Role: Mentor
Funding Sponsor: WMU OVPR Undergraduate Research Excellence Award
Period: Spring 2018

Title: *Validation of the MKV Aeroship through Flight Testing*
Role: Mentor
Funding Sponsor: WMU OVPR Undergraduate Research Excellence Award
Period: Fall 2015

Title: *Automotive Exhaust waste Heat Recovery System using Thermoelectric*
Role: Mentor
Funding Sponsor: WMU OVPR Undergraduate Research Excellence Award
Period: Spring 2015

Title:	*GT-15V Turbojet Engine*
Role:	Mentor
Funding Sponsor:	WMU OVPR Undergraduate Research Excellence Award
Period:	Fall 2014

Curriculum Development

Title:	*Electric Ducted Fan Platform – A Portable Lab Module for Aircraft Electric Propulsion*
Role:	Faculty
Funding Agency:	WMU College of Engineering and Applied Sciences
Period:	2019

Title:	*Turbine Engine Laboratory Enhancement for Aeropropulsion Education*
Role:	Principal Investigator
Funding Agency:	Michigan Space Grant Consortium
Period:	2004

Title:	*MEMS Flow and Heat Transfer Simulations*
Role:	Principal Investigator
Funding Agency:	Michigan Space Grant Consortium
Period:	2000

3. PUBLICATIONS

Books/Chapters

3. *Effects of Excessive Water Intake on Body-Fluid Homeostasis and the Cardiovascular System – A Computer Simulation*. Y. Zhang, W.W. Liou, and V. Gupta. in *Emerging Trends in Applications and Infrastructures for Computational Biology, Bioinformatics, and Systems Biology.* Elsevier, Inc. 2016.
2. *Encyclopedia of Micro- and Nanofluidics.* Sole Contributor to *Chaotic Flows* and *Monte Carlo Method.* Co-Contributor to *Non-Continuum Approach*. Springer-Verlag, New York, 2008. 2014.
1. *Microfluid Mechanics, Principles and Modeling*. William W. Liou and Yichuan Fang, McGraw-Hill, New York, 2005.

Refereed Professional Journal Publication

47. "Lube oil expulsion in a front axle predicted using particle-based simulations," J. Xu, W.W.Liou, and D. Dawson. **SAE International Journal of Passenger Vehicle Systems**. 16(1) (2023). DOI:10.4271/15-16-01-0005.
46. "Transmission fluid properties effects on performance characteristics of a torque converter: A computational study," Y. Yang, W.W. Liou, F. Qureshi, D.J. Whitticar, M.E. Huston. **Tribology Transactions** (2021). DOI: 10.1080/10402004.2021.1964662.
45. "Does acromion anatomy affect the risk of acromion stress fracture after reverse shoulder arthroplasty?" V. Sabesan (MD); D. Lima (MD); R. Rudraraju (MD); Y. Yang (PhD); M. Stankard; W. W. Liou (PhD). **Seminars in Arthroplasty: JSES**, 31(1) , 8-14 (2020).
44. "GIS-Based Automatic Flight Planning of Camera-Equipped UAVs for Fire Emergency Response," M. Sulaiman, H. Liu, M. Binalhaj, W.W. Liou, O. Abudayyeh. **International Journal of Mechatronic and Mechanical Engineering**, 14(5), 203-208 (2020).
43. "The role of greater tuberosity healing in reverse shoulder arthroplasty: A finite element analysis," V. Sabesan (MD); D. Lima (MD); Y. Yang (PhD); M. Stankard; M. Drummond (MD); W. W. Liou (PhD). **Journal of Shoulder and Elbow Surgery**, 29, 347-354 (2020).

42. "Oscillating-Wing unit for power generation," T. Liu, R.S. Ramasamy, W.W. Liou., and D.M.Salazar. **Journal of Power and Energy**, 233(4), 510-529 (2019).

41. "A computer simulation of short-term adaptations of cardiovascular hemodynamics in microgravity," B.Gerber, J.Singh, Y.Zhang, W.W.Liou. **Computer in Biology and Medicine**, 102, 86-94 (2018).

40. "Unsteady disturbances in micro Rayleigh-Bénard flows using direct simulation Monte Carlo method," Y.Fang and W.W.Liou. **International Journal of Aeroacoustics,** 17 (4-5) 425-437, (2018).

39. "Computational conjugate heat transfer analysis of a hybrid electric vehicle inverter," Y.Yang, W.W.Liou, and X. Kang. **Heat Transfer Engineering**, 39, 1715-1725 (2018).

38. "Effect of lateralized design on muscle and joint reaction forces for reverse shoulder arthroplasty," W.W. Liou, Y. Yang, G.R. Petersen-Fitts (MD), D.J. Lombardo (MD), S. Stine, V. Sabesan (MD). **Journal of Shoulder and Elbow Surgery**, 26, 564-572 (2017).

37. "Numerical study of low-Reynolds number flow over rotating rigid helix: an investigation of the unsteady hydrodynamic," W.W.Liou and Y.Yang. **Fluid Dynamics Research**, 4 (47) (2015).

36. "Modeling of high sodium intake effects on left ventricular hypertrophy," Y. Zhang, W.W. Liou, and V. Gupta (MD). **Computer in Biology and Medicine**, 58, 31-39 (2015).

35. "A best practices guide to CFD education in the undergraduate curriculum," J.D. Eldredge, I. Senocak, P. Dawson, J. Canino, W.W. Liou, R. LeBeau, D.L. Hitt, M.P. Pumpfkeil, and R.M. Cummings. **International Journal of Aerodynamics**, 4, 200-236 (2014).

34. "Computational aerodynamics of baseball, soccer ball, and volleyball," P.Jalilian, P.K. Kreun, M.M. Makhmalbaf, W.W. Liou. **American Journal of Sports Science**, 2(5), 115-121 (2014).

33. "A direct heating immersed boundary-lattice Boltzmann method for thermal flows," O.O. Bamiro, W.W. Liou. **International Journal of Numerical Methods for Heat and Fluid Flow**, 24, 169-200 (2014).

32. "Shock wave impact simulations of a vehicle occupant using fluid/structure/dynamics interactions," Y.Yang and W.W. Liou, J.Sheng, D.Gorsich, S.Arepally. **International Journal of Impact Engineering**, 52, 11-22 (2013)[1]

31. "Computational study of compressive loading of carbon nanotubes using quasi-continuum method," Y. Yang and W.W. Liou. **Journal of Computational Science**, 3, 142-149 (2012).

30. "Microgas turbine engine characteristics using biofuel," E. Tan and W.W. Liou. **The Hilltop Review**, 5, 40-50 (2011).

29. "Analytical investigation of free surface flow in multi-layer porous media," Y. Peng, W.W. Liou, and P. Parker. **Colloids and Surfaces A: Physicochemical and Engineering Aspects**, 380, 213-221 (2011).

28. "A reduced-order general continuum method for dynamic simulations of carbon nanotube," Y.Yang and W.W.Liou. **International Journal for Nanotechnology and Molecular Computing**, 2 (3), 1-24 (2010).

27. "Post-Stall flow control using a flexible fin on airfoil," T. Liu, J.Montefort, W.W.Liou, and S.Pantula, **AIAA Journal**, 48, No. 6, 1235-1247 (2010).

26. "A new second-order closure for rough-wall turbulent flows using the Brinkman equation," M.-H.Lu and W.W.Liou. **Computers and Fluids**, 39, 626-639 (2009).

25. "Analytical modeling of capillary flow in tubes of nonuniform cross section," W.W. Liou, Y.Peng, P.Parker. **Journal of Colloid and Interface Science**, 333, 389-399 (2009).

24. "Rough wall layer modeling using the Brinkman equation," W.W.Liou and M.-H.Lu. **Journal of Turbulence**,10, 1-24 (Invited) (2009).

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[1] *Science Direct Top 25 List of Most Downloaded Article, October – December 2012.*

23. "Aeroship: A hybrid flight platform," T.Liu, W.W.Liou, and M.Schulte. **Journal of Aircraft**, 46, 667-674 (2009).

22. "A new two-equation closure for turbulent flows over rough walls using the Brinkman equation," M.-H.Lu and W.W.Liou. **AIAA Journal**, 47, No.2, 386-398 (2009).

21. "Static extended trailing edge for lift enhancement," T. Liu, J. Montefort, W.W. Liou, and S. Pantula. **Journal of Aircraft**, 44, 1939-1947 (2007).

20. "Assessment of two low-Reynolds-number k-ε models in turbulent boundary layer with surface roughness," M.-H.Lu and W.W.Liou. **Journal of Spacecraft and Rockets**, 44, No.6. pp.1307-1316 (2007).

19. "Comparison of computational and experimental aerodynamics: Results for a WMU solar car model," Y. Yang and W.W.Liou, **The Hilltop Review**, 1, (1) 6 (2005).

18. "Forced Couette flow simulations using direct simulation Monte Carlo method," W.W.Liou and Y.Fang. **Physics of Fluids**, 16, 4211-4220, (2004).

17. "Skin friction prediction for high-speed turbulent boundary layers with ablation," Y.Fang, W.W.Liou, and S.Xu, **Journal of Spacecraft and Rockets**, 41, 893-895 (2004).

16. "Compressible linear stability of confluent wake/boundary layers," W.W.Liou and F.Liu, **AIAA Journal**, 41, No.12, 2349-2356 (2003).

15. "Bursting frequency predictions for compressible turbulent boundary layers," W.W.Liou and Y.Fang, **AIAA Journal**, 41, No.6, 1022-1088 (2003).

14. "Computations of the flow and heat transfer in microdevices using DSMC with implicit boundary conditions," Y.Fang and W.W.Liou, **Journal of Heat Transfer**, 124, Issue 2, 338-345 (2002).

13. "Heat transfer in microchannel devices using DSMC," W.W.Liou and Y.Fang, **Journal of Microelectromechanical Systems**, 10, 274-279 (2001).

12. "Spatial linear instability of confluent wake/boundary layers," W.W.Liou and F.Liu, **AIAA Journal**, 39, No. 11, 2076-2081 (2001).

11. "Implicit boundary conditions for Direct Simulation Monte Carlo method in MEMS flow predictions," W.W.Liou and Y.Fang, **Computer Modeling in Engineering and Sciences**, 1, 119 (2000).

10. "Turbulence model assessment of shock wave/turbulent boundary-layer interaction in transonic and supersonic flows," W.W.Liou, G.Huang, and T.-H.Shih, **Computers and Fluids**, 29, 275-299 (2000).

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13. "Computational fluid dynamics (CFD) modeling of torque converter and experimental validation," W.W.Liou, Y.Yang, D.Whitticar, F.Qureshi, M.E.Huston Engine & Drive Train V: Special Topics, Surface/Wear Session, 74th Society of Tribologists and Lubrication Engineers (STLE) Annual Meeting and Exhibition, May 19-23, 2019. Nashville, Tennessee.
12. "CFD modeling of fluid properties on torque converter efficiency in automatic transmissions", Y.Yang, W.Liou, D.Whitticar, F.Qureshi, M.E.Huston SAE WCX 9-11 April 2019, Detroit, Michigan. SAE paper 19PFL-0996.
11. "Does greater tuberosity healing affets biomechanics of reverse shoulder arthroplasty?" V.Sabesan (MD), W.Liou (PhD), Y.Yang (PhD), M.Stankard (BS), Diego Lima (MD), M Drummond (MD). Orthorpaedic Summit, December 5-8, 2018, Las Vegas, Nevada.
10. "Cardiovascular hemodynamics and body fluid homeostasis in microgravity – a computer simulation" Y. Zhang and W.W. Liou, 34th American Society for Gravitational and Space Research Conference, October 31 – November 3, 2018, Rockville, Maryland.
9. "Does acromion anatomy affect acromion stress fracture after reverse shoulder arthroplasty?" V. Sabesan, (MD), W. Liou (PhD), Y. Yang (PhD), D. Lima (MD). International Society for Technology in Arthroplasty, 10-13 October 2018, London, UK.
8. "Does greater tuberosity affect implant performance in reverse shoulder arthroplasty ?" V. Sabesan, (MD), W. Liou (PhD), Y. Yang (PhD), M. Stankard (BS), D. Lima (MD). American Shoulder and Elbow Surgeons 2018 Annual Meeting, 11-14 October 2018, Chicago, Illinois.
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6. "Biomechanical Assessment of Lateralized design for Reverse Shoulder Arthroplasty," V. Sabesan (MD), G. Petersen-Fitts (MD), D. Lombardo (MD), W.W. Liou (PhD) and Y. Yang (PhD). 17th Annual Meeting of the International Society for Computer Assisted Orthopaedic Surgery, 14-17 June 2017, Aachen, Germany.
5. "Applications of MpCCI-based fluid-structure interactions coupling to vibrational and rotational blades," Y. Yang, W.W. Liou, and P. Bayrasy. NAFEMS European Multiphysics Conference, , Copenhagen, Denmark, November 2016.

4. "Shoulder-Kinematics and Mechanics," V.Sabesan (MD), G.Petersen-Fitts (MD), W.Liou, Y.Yang, S.Stine (MD), Orthopaedic Research Society 2016 Annual Meeting, poster presentation, 2016.
3. "Effect of Lateralized design on Muscle and Joint Reactive Forces for Reverse Shoulder Arthroplasty, " D. Lombardo(MD), Y.Yang, W.W.Liou, S.Stine (MD), G.Petersen-Fitts (MD), V.Sabesan (MD). International Congress of Shoulder and Elbow Surgeons 2016. Also, Michigan Orthopaedic Society 2016 Annual Scientific Meeting 17-19 June 2016, Mackinc Island, Michigan.
2. "Biomechanical analysis of commercially available RSA Design," D.Lombardo (MD), Y. Yang (PhD) W.W.Liou (PhD), C.Frank, V.Sabesan (MD). Presentation at the American Academy of Orthopaedic Surgeons Annual Meeting 2016.
1. "DSMC simulations of disturbance dynamics in a forced chaotic flow," JANNAF Joint meeting, Dec.1-5, 2003, Colorado Springs, Colorado.

Other Publications (as Editor)

4. Research Briefs-1993, Center for Modeling of Turbulence and Transition, Edt. W.W. Liou, NASA TM 106383 (1993).
3. Proceedings of Workshop on Engineering Turbulence Modeling, Edt. L.A. Povinelli, W.W. Liou, A. Shabbir, and T.H. Shih, NASA CP 10080 (1992).
2. Research Briefs-1992, Center for Modeling of Turbulence and Transition, Edt. W.W. Liou, NASA TM 105834 (1992).
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4.   INVITED LECTURES/PRESENTATIONS

18. "Comparing finite volume & particle CFD simulation methods for understanding lubrication in automotive transmissions & axles," J.Xu, W.W.Liou, Y.Yang. Invited presentation at Prometech Simulation Conference 2021 (Virtual), December 9, 2021.

17. Ventricular Cerebrospinal Fluid Flow Computational Simulations, Invited Lecture, University of Diyala, Iraq, 18 June 2021.

16. Who Let the College Students Out of The Classroom as We Know It? Invited Lecture, Tamkang University, Taiwan, 28 March 2019.

15. Modeling of Microgravity Effects on Cardiovascular Haemodynamics, Invited Lecture. National Taiwan Ocean University, Taiwan, 25 February 2019.

14. Wait, Aerodynamics and What?. Barnes W. McCormick Honorary Lecture, Aerospace Engineering Department, Penn State University, 28 March 2016.

13. Physics-Based Engineering Computations. Invited Lecture, Mechanical Engineering Department, New York University, 25 March 2013.

12. Predicting the Perfect Storms – The Evolution of Complex Calculations, Distinguished University Faculty Scholar Lecture, Western Michigan University, 7 April 2010.

11. Sciences and Engineering in Land and Aerial Vehicles Research, Invited presentation in American Chemistry Society, 2 March 2010.

10. Rough Wall Layer Modeling Using the Brinkman Equation, Invited paper in *Turbulent Boundary Layer*, 5th AIAA Theoretical Fluid Mechanics Conference, Seattle, Washington, 23-26 June 2008.

 9. Career Development/Building a Successful Research Program, Grant Development Workshop, Office of the Vice President for Research, Western Michigan University, January 18, 2008.

8. <u>Extended Trailing Edge: Experimental and Computational Studies</u>, Invited paper in *Further Case Studies in the Fluids Information Triad*, 46th AIAA Aerospace Sciences Meeting and Exhibit, Reno, Nevada, 7-10 January 2008.

7. <u>Globalization in Engineering-Automotive</u>, Invited speaker in *Engineering for the Global Market: Automotive Excellence*. 26th American Society of Engineers of Indian Origin (ASEI) National Convention, McLean, Virginia, Aug. 31-Sept 1, 2007.

6. <u>Center for Advanced Vehicle Design and Simulation</u>, Invited Luncheon Speaker, Engineering Leaders Conference, DANA Corporation, Commercial Vehicle Systems, May 30, 2007.

5. <u>Recent Research and CAViDS</u>, Invited presentation at Shanghai Automotive Wind Tunnel Center, Tongji University, Shanghai, China, 2006.

4. <u>Microfluid Dynamics</u>, Invited paper in 24th International Symposium on Rarefied Gas Dynamics, Bari, Italy. July 10th-16th, 2004.

3. <u>Shock Wave/Turbulent Boundary Layer Interaction and Combustion Modeling</u>, US Army Aviation & Missile Command, 1998.

2. <u>Bypass Transitional Flow Modeling</u>, Department of Engineering Mechanics, University of Michigan, 1998.

1. <u>Computational Modeling of Turbulent Flows,</u> *Advances in Computational Fluid Dynamics* short course, Louisiana Tech University, 1996.