

Junkun Ma

Professor

Department of Engineering Technology
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EDUCATION

Ph.D., Engineering Science/Applied Mechanics (Joint Doctoral Program) 2004

Dept. of Mechanical Engineering San Diego State University
Dept. of Mechanical & Aerospace Engineering University of California, San Diego
Dissertation: Synthesis of Dense TiC-Ti Based Cermets via Self Propagating High-Temperature Synthesis and Quasi-Isostatic Pressing

MS, Mechanical Engineering 1999

Dept. of Mechanical Engineering N. China Electric Power University
Thesis: Safety and Durability Evaluation of High-Pressure Vessels Containing Non-Through Defects

B.S., Applied Engineering Mechanics 1996

Dept. of Applied Engineering Mechanics Tsinghua University
Thesis: Distribution of Elastic-Plastic Field on Circular Rings Containing a Rounded Tip V-Notch under Incline Compressive Load

PROFESSIONAL EXPERIENCE

Professor 08/2020 ~ Current

Associate Professor 08/2016 ~ 07/2020

Department of Engineering Technology, Sam Houston State University

Associate Professor 08/2013 ~ 07/2016

Assistant Professor 08/2007 ~ 07/2013

Department of Industrial and Engineering Technology, Southeastern Louisiana University

Visiting Assistant Professor 05/2005 ~ 07/2007

Division of Math and Natural Science, Penn State Univ., Altoona

Postdoctoral Fellow 11/2004 ~ 05/2005

Powder Technology Laboratory, San Diego State University

Co-Op Internship 06/2003 ~ 11/2004

RAS Computer Analysis Lab, Sun Microsystems Inc. San Diego, CA

Graduate Research Assistant 09/1999 ~ 11/2004

San Diego State University/ University of California, San Diego

Mechanical Engineer 06/1996 ~ 07/1999

DeShiChuang Corp. Beijing, China

PROFESSIONAL CERTIFICATIONS

- FANUC Certified Industrial Robot Handling Tool Operation and Programming
- FANUC Certified Industrial Robot iRVision-2D Operation and Programming
- FANUC Certified Online CNC Turning Center
- FANUC Certified Online CNC Machining Center
- SIEMENS LEAP Certification Level 1 – Milling
- SIEMENS LEAP Certification Level 1 – Turning
- ABET Institute for the Development of Excellence in Assessment Leadership (IDEAL) Scholar

PUBLICATIONS

Journal papers

- E. Fairbanks, J. Turner, **J. Ma**, C. Yu. Development of Novel Finger-Trigger Interface for Trigger Pull Measurement, *Journal of Forensic Sciences*, 65.6, 1954-1960, (2020).
- **J. Ma** and M. Suh. Design and Development of a Laboratory-Scale Dual Axis Solar Tracking System, *International Journal of Engineering Research and Innovation*, Vol. 12 (1), 40-48, (2020).
- **J. Ma**, K. Coogler, & M. Suh. Inquiry-based learning: Development of an introductory manufacturing processes course based on a mobile inverted pendulum robot, *International Journal of Mechanical Engineering Education*, 0306419019844257, (2019).
- M. Suh, Y. Zhang, Y. Ahn, **J. Ma**, and A.R. Pearce. The Impact of LEED-Energy Star Certified Office Buildings on the Market Values of Neighboring Areas in New York City, *Journal of Construction Engineering and Project Management*, 9(2), 25-51, (2019).
- C. Cui, **J. Ma**, & B. Liu, Optimized composites with the largest material usage efficiency. *International Journal of Solids and Structures*, 161, 193-202 (2019).
- C. Koutsougeras, **J. Ma**, H. Luo. Study of a Vertical Axis Wind Turbine with Deflection Panels: COMSOL 2D Simulation of a Single Panel, *Journal of Advanced Research in Modeling and Simulation*, Vol. 1, Issue 1&2 -2018, Pg. No. 1-8. (2018).
- **J. Ma**, C. Koutsougeras, Effects of Design Parameters on the Fluid Flow and the Efficiency of Single Ended Evacuated Tubular Solar Thermal Collectors via FEM Modeling Experimentation, *Engineering Journal*, Vol. 19, No 5 (2015).
- **J. Ma**, EA Olevsky, Numerical Simulation of Densification and Deformation of Porous Bodies in a Granular Pressure-Transmitting Medium, *Advances in Sintering Science Technology*, *Ceramic Transactions*, Vol. 209, Pages 113-124 (2009).
- **J. Ma**, G.J. Weisel, B.L. Weiss, N.M. Miskovsky, D.T. Zimmerman, Systematic Study of Microwave Absorption, Heating, and Microstructure Evolution of Porous Copper Powder

Metal Compacts, *J. of Applied Physics*, 101, 074906 (2007).

- EA Olevsky, **J. Ma**, and M.A. Meyers, Densification of Porous Bodies in a Granular Pressure-Transmitting Medium, *Acta. Materialia*, Vol. 55, Issue 4, Pages 1351-1366 Feb., (2007).
- **J. Ma**, EA Olevsky, and M.A. Meyers, Modeling of pressure transmission during post-reactive-sintering quasi-isostatic pressing, *Sintering 2003*, Eds. R.M. German, G.L. Messing, R.G. Cornwall, 6 p. (2003).
- H. Shi, **J. Ma**, X. Qing, Distribution of Elastic-Plastic Field on Circular Rings Containing a Rounded Tip V-Notch under Incline Compressive Load, *Chinese Journal of Applied Mechanics*, Page 13, No2, (1999).

Conference proceedings/presentations

- **J. Ma**, F. Yildiz, R. Pecan, M. Casper, A. Weirich, Involving Multidisciplinary Undergraduate Students in the Design and Development of an Innovative Device for the Detection of Plant Nematodes, 2023 ASEE Annual Conference and Exposition, Jun. 25-28, Baltimore, MD, (2023)
- **J. Ma** and S. Obeidat, Design and Development of a Manufacturing Process and Machining Technology Course Sequence, 2022 ASEE Annual Conference and Exposition, Jun. 26-29, Minneapolis, MN, (2022)
- S. Obeidat, **J. Ma**, S. Himmelstein, and A. Acharya. The Impact of the Printed Part Geometry on the Shrinkage and Relative Density in Binder Jetting Additive Manufacturing of Ceramics Powder, Proceedings of the ASME 2022, International Mechanical Engineering Congress and Exposition, IMECE2022, Oct. 30 – Nov. 3, Columbus, Ohio, (2022)
- S. Obeidat, J. Nervis Jr., and **J. Ma**, The Impact of the Printed Part Geometry on the Shrinkage and Density of 316L Stainless Steel Parts Printed by FFF/FDM Technology, 2022 Annual International Solid Freeform Fabrication Symposium – An Additive Manufacturing Conference. Austin, TX, 2022. pp 1870- 1877. (2022)
- S. Obeidat, **J. Ma**, and U. Dakeev, Teaching AutoCAD in E-learning and Face-to-Face Styles for Undergraduate Engineering Technology Students During and after COVID-19 Pandemic, 2022 ASEE Annual Conference and Exposition, Jun. 26-29, Minneapolis, MN, (2022)
- L. Sebesta, B. Lowry, C. Ratchliffe, E. Westernman, L. Y, D. Barquero, A. Weirich, R. Acharya, A. Smith, R. Pecan, U. Dakeev, F. Yildiz, **J. Ma**, Development of a Handheld Minirhizotron Device for Rapid Detection of Cyst Nematodes, 2021 NAISMA Annual Conference, Sept. 27-30, (2021)
- L. Sebesta, B. Lowry, C. Ratchliffe, E. Westernman, L. Y, D. Barquero, A. Weirich, R. Acharya, A. Smith, R. Pecan, U. Dakeev, **J. Ma**, F. Yildiz, Development of Automated Invasive Pest Survey and Sorting Device for Field Deployment, 2021 NAISMA Annual

Conference, Sept. 27-30, (2021)

- **J. Ma**, and I. Basith, Integration of an Industrial Robot with a CNC machining Center, *ASEE 127th Annual Conference and Exposition*, Montreal, QC, Canada, June 21-24, (2020)
- Basith, **J. Ma**, F. Yildiz, Certification and Training for Automation and Mechatronics, *ASEE 127th Annual Conference and Exposition*, Montreal, QC, Canada, June 21-24, (2020)
- **J. Ma**, and K. Coogler, Learning-by-doing: Development of Project-Based Manufacturing Courses, *ASEE 126th Annual Conference & Exposition*, Tampa, FL, June 16-19, (2019).
- I. Basith, and **J. Ma**, Integrating a FANUC robot with an EMCO machining center, *11th International Conference on Engineering and Computer Education*, Guimarães, Portugal, September 8-11, (2019).
- **J. Ma**, Project-Based Manufacturing Courses, *Congreso Internacional De Ingenierias II*, San Jose, Costa Rica, September 19, (2019). (Keynote Speaker – Oral Presentation)
- **J. Ma**, Drag Force on a Vertical Axis Wind Turbine with Airfoil Pitch Control, *COMSOL Annual Conference 2019*, Boston, MA, October 2-4, (2019).
- I. Basith, & **J. Ma**, Use of FANUC robots in Manufacturing Curriculum, *International Mechatronics Conference and Exhibition*, Stillwater, OK, Oct. 23-25, (2019). (Abstract)
- M. Suh, S. K. Sands, K. Kim, Y. Ahn, **J. Ma**, and E. Karan, Cyber Security Awareness in Construction-Related Courses at Higher Education Institutions, *Proceeding of Sustainable Building and Environment 2019*, Seoul, South Korea, December 12-13, (2019).
- **J. Ma** and M. Suh, Evaporative Cooling in Solar Absorption Chiller, *COMSOL Conference 2018 Boston*, Boston, MA, October 3-5, (2018).
- **J. Ma**, Further Development of Capstone Design Project Courses based on a Case Study, *ASEE's 124th Annual Conference & Exposition*, Columbus, OH, June, (2017)
- **J. Ma**, C. Koutsougeras, H. Luo, Efficiency of a Vertical Axis Wind Turbine (VAWT) with Airfoil Pitch Control, *International COMSOL 2016 Conference*, Boston, MA, October, (2016)
- **J. Ma**, C. Koutsougeras, Evaluation of Design Efficiency via COMSOL Simulations, *2014 EPSCoR Industry-Academia Workshop on Advanced Materials and Manufacturing*, New Orleans, November (2014)
- **J. Ma**, *Microwave and Spark Plasma Sintering (SPS): recent experimental development, modeling and simulation using COMSOL Multiphysics*, *Pole University Leonard De Vinci International Week*, Paris, France. March, (2013)
- **J. Ma**, A. Parker, K. Kuang, *Thermal Properties of Copper Tungsten with Copper Via Composite*, *International COMSOL 2011 Conference*, Boston, MA, October, (2011).
- **J. Ma**, X. Wei, *Efficiency of Evacuated Tubular Solar Thermal Collector*, *International COMSOL 2011 Conference*, Boston, MA, October, (2011)

- K. Kuang, D. Zhu, **J. Ma**, Development of Super Copper Tungsten, *IMAPS ATW on R.F./Microwave Packaging*, San Diego, CA, September, (2009).
- **J. Ma**, X. Wei, Numerical Study of the Performance of a Super CuW / BeO Package, *IMAPS ATW on R.F./Microwave Packaging*, San Diego, CA, September, (2009).
- D. Zimmerman, J. Diehl, E. Johnson, K. Martin, **J. Ma**, Systematic Study of Microwave Absorption, Heating, and Microstructure Evolution of Porous Copper Powder Metal Compacts, *APS Spring 2008 Conference*, New Orleans, March, (2008).
- K. Martin, J. Cardellino, E. Johnson D. Zimmerman, **J. Ma**, Percolation Studies of Metal-insulator Composites at Microwave Frequencies, *APS Spring 2008 Conference*, New Orleans, LA March, 2008
- **J. Ma**, C.T. Smith, G.J. Weisel, B.L. Weiss, N.M. Miskovsky, D.T. Zimmerman, Single Mode Microwave Heating of Copper Powder Metal Compacts, *International COMSOL 2006 Conference*, Boston, Oct. (2006).
- **J. Ma**, EA Olevsky, and M.A. Meyers, Synthesis of dense TiC-Ti based cermets via self-propagating high temperature synthesis and quasi-isostatic pressing, *Proceeding 36th International SAMPE Technical Conference* (2004).
- X. Wang, **J. Ma**, A. Maximenko, E.A. Olevsky, M. B. Stern, and B. M. Guenin, Preliminary study on synthesis of composites by electrophoretic deposition and microwave sintering, *Proceeding Annual IMAPS Conference*, Long Beach, CA (2004).
- **J. Ma**, E. Olevsky, and M. Meyers, Modeling of Densification of Cermet Composites, *16th Annual CSU Student Research Competition*, Long Beach, CA, May, (2002).

GRANTS

External

- **J. Ma** (PI), F. Yildiz (Co-PI), R. Pecen (Co-PI), T. Pannkuk (Co-PI), A. Smith-Herron (Co-PI), *Testing of a Handheld Infrared Thermography-Minirhizotron Device for Nondestructive Rapid Detection of Cyst Nematode*, Plant Protection Act FY2022 (Annual) Implementation Plan for Section 7721, US Department of Agriculture, **\$140,000** (2021)
- **J. Ma** (PI), F. Yildiz (Co-PI), R. Pecen (Co-PI), T. Pannkuk (Co-PI), A. Smith-Herron (Co-PI), *Development of a Handheld infrared Thermography-Minirhizotron Device for Nondestructive Rapid Detection of Cyst Nematodes*, Plant Protection Act FY2021 (Annual) Implementation Plan for Section 7721, US Department of Agriculture, **\$139,000** (2020)
- R. Balaraman (PI), **J. Ma** (Co-PI), B. Brooks (Co-PI), P. Ramsay (Co-PI), J. Cook (Co-PI), W. Godwin (Co-PI), K. Skillern (Co-PI), *To support for STEAM Education for School Students in Walker, County, Texas*, Powell Foundation, **\$50,000** (2020)
- **J. Ma** (PI), F. Yildiz (Co-PI), R. Pecen (Co-PI), A. Smith-Herron (Co-PI), *Development of*

a Handheld infrared Thermography-Minirhizotron Device for Nondestructive Rapid Detection of Cyst Nematodes, Plant Protection Act FY2020 (Annual) Implementation Plan for Section 7721, US Department of Agriculture, **\$131,834** (2019)

- F. Yildiz (PI), R. Pecen (Co-PI), **J. Ma** (Co-PI), A. Smith-Herron (Co-PI), *Design and Development of Automated Insect/Pest Control and Sorting Devices for Field Deployment*, Plant Protection Act FY2020 (Annual) Implementation Plan for Section 7721, US Department of Agriculture, **\$146,814** (2019)
- **J. Ma (PI)**, M. Saadeh (Co-PI), L. Ho-hoon (Co-PI), *Development of an Engineering Design, Analysis, and Prototyping Laboratory*, Louisiana Board of Regents (\$53,500) and Southeastern Louisiana University (\$17,000). Total **\$70,500** (2015)
- V. Sebastian (PI), **J. Ma (Co-PI)**, *Tapping into a Well of Potential*, American Association of Drilling Engineers. **\$25,000** (2014)
- M. Saadeh (PI), **J. Ma (Co-PI)**, *Automated Rod Singulation Station*, Louisiana Board of Regents (\$11,850) and Laitram LLC. (\$9,736). Total **\$21,586** (2014)
- **J. Ma (PI)**, *Microwave and Spark Plasma Sintering (SPS): recent experimental development, modeling and simulation using COMSOL Multiphysics*, International Week, Pole University France. **\$3,000** (2013)

Internal

- **J. Ma (PI)**, *Design and Development of Project-Based Instructional Materials for ETEC3375 Statics*, SHSU STEM Center: Scholarship of Teaching and Learning, **\$2,000** (2019)
- **J. Ma (PI)**, I. Basith (Co-PI), *Integrating a Fanuc Industrial Robot with an Emco Machining Center*, Office of Research & Sponsored Program (ORSP): Pilot Study Program, **\$10,376** (2018)
- D. Fritsche (Student), B. Lowry (Student), **J. Ma** (Faculty), *Development of a Robotic Platform for Wetland Studies*, Summer 2019 Faculty And Student Team (FAST) Awards, Enhancing Undergraduate Research Experiences & Creative Activities (EURECA), **\$8,000** (2018)
- H. Martinez (Student), **J. Ma** (Faculty), *Experimental Study of Vertical Axis Wind Turbine (VAWT) with Pitch and Camber Controls*, Summer 2018 Faculty And Student Team (FAST) Awards, Enhancing Undergraduate Research Experiences & Creative Activities (EURECA), **\$6,000** (2017)
- **J. Ma (PI)**, K. Coogler (Co-PI), *Development of a Project-based Introductory Manufacturing Process Course*, Professional and Academic Center for Excellence, Sam Houston State University, **\$7,000** (2017)
- **J. Ma (PI)**, *Modeling a VAWT with Pitch and Camber Controls*, Faculty Research Grant (FRG), Office of Research and Sponsored Program (ORSP), **\$6,000** (2016)

- **J. Ma (PI)**, *Expanding Computational Power of the COMSOL Software Package by Acquiring Computational Fluid Dynamics (CFD) Module*, Office of Technology, Southeastern Louisiana University. **\$4,495** (2013)
- **J. Ma (PI)**, *Acquisition of the SolidWorks 3D CAD Software*, Center for Faculty Excellence of Southeastern Louisiana University. **\$1,000** (2012)
- **J. Ma (PI)**, *Biomass based experimental Bio-Ethanol production plant*, Office of Technology of Southeastern Louisiana University. **\$5,000** (2011)
- **J. Ma (PI)**, *Evaluation of the Performance of a Vacuumed Tube Solar Water Heater*, Office of Technology of Southeastern Louisiana University. **\$4,730** (2010)
- N. Huy, D. Joshua, D. Aaron, R. Thomas, C. Bradley, **J. Ma (Faculty Advisor)**, *Solar Water Heating System Analog-to-Digital Signal Converter*, STAR Program of the College of Science and Technology, Southeastern Louisiana University. **\$1,497.94** (2009)
- P. Derek, F. Jameson, **J. Ma (Faculty Advisor)**, *Mini Baja Car Project*, STAR Program of the College of Science and Technology, Southeastern Louisiana University. **\$2,145** (2009)
- **J. Ma (PI)**, *Numerical Computing and Graphics Power for the Engineering Technology Bachelors' Degree Program*, Office of Technology of Southeastern Louisiana University. **\$15,348** (2008)
- **J. Ma (PI)**, *Design and Fabrication of Miniature Lightweight Bridge*, Office of Technology of Southeastern Louisiana University. **\$4,989** (2008)

SERVICES

- NSF Reviewer 2020 & 2021; NSF Reviewer Panelist 2021 & 2022
- Reviewer: Journal of Aerospace Engineering, Journal of Engineering Technology, Journal of Mechanical Engineering Education, American Society for Engineering Education
- University Patent Review Committee & University Faculty Research Council
- ABET Accreditation Coordinator & SACS Assessment Coordinator
- Development of New Degree Proposal, Curriculum, and Courses
- Judge for Science & Engineering Fair of Houston (SEFH) & Future City Competition, Houston

PROFESSIONAL AFFILIATIONS

- American Society for Engineering Education (ASEE)
- The American Society of Mechanical Engineers (ASME)