

Mechanical/Electrical Engineer, Jeong Tae (JT) Ok, PhD

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Education

- **PhD**, Engineering Science (Interdisciplinary Mechanical and Electrical Engineering), Louisiana State University, Baton Rouge, LA May 2011
(*Thesis: Droplet Motion on Miniaturized Ratchets, Supervised by Dr. Sunggook Park*)
- **MS**, Electrical Engineering, Louisiana State University, Baton Rouge, LA May 2007
- **ME**, Electronics Engineering, Sun Moon University, Asan, Republic of Korea (Thesis: *Hardware Implementation of Artificial Neural Networks, Supervised by Dr. Eungsoo Kim*) Feb. 1998
- **BS**, Mechanical Engineering, Sun Moon University, Asan, Republic of Korea Feb. 1995

Academic Experience

- Teaching Assistant Professor (Instructor), Mechanical & Electrical Engineering, Wright State University, Celina, OH Jan. 2021 - Present
- Assistant Professor, Mechanical Engineering, Midwestern State University (MSU Texas), TX Aug. 2013 – May 2020
- Postdoctoral Researcher, Chemical and Biological Engineering, Colorado School of Mines, CO (*RPSEA Project: Micro- and Nanoscale Porous Media Analogs, Supervised by Dr. Keith B. Neeves and Dr. Xiaolong Yin*) Jul. 2011 – Jul. 2013

Industry Experience

- *Significant clean room fabrication and characterization of two-phase fluids flow* that lead to industrial collaboration with Halliburton oil and gas on developing surfactant for EOR Dec. 2012 – July 2013
- *Multiwall Carbon Nanotube switch manufacturing* by collaborating with Schlumberger Ltd. as graduate research assistant (*supervised by Dr. Bingqing Wei*) Sep. 2004 – May 2006
- *Machining* undergraduate internship at Tongil Heavy Industries Co., Ltd. for operating CNC lathe and milling machine as machining assistant Dec. 1994 – Feb. 1995
- *Manufacturing* undergraduate internship at Daedeok Corporation for operating and installing the slitting machine as manufacturing assistant Dec 1991 – Feb 1992, Jul – Aug 1992

Teaching Course

Midwestern State University

(Mechanical Engineering, EAC/ABET BS, 2013-2020)

- MENG 1202 *Solid Modeling*
- MENG 2213 *Dynamics*
- MENG 2204 *Electronics Lab*
- MENG 3104 *Fluid Mechanics*
- MENG 3104 *Fluid Mechanics Lab*
- MENG 3114 *Materials Science*
- MENG 3114 *Materials Science Lab*
- MENG 3234 *Heat Transfer Lab*
- MENG 4134 *Machine Elements Design Lab*
- MENG 4143 *Senior Design Lab I & II*

Wright State University

(Mechanical Engineering, EAC/ABET BS, 2021 Spring-Present)

- ME 1020 *Engineering Programming with MATLAB (Spring)*
- ME 1040 *Engineering Design & Solid Modeling (Fall)*
- ME 2700 *Structure and Properties of Materials I & Recitation (Fall)*
- ME 3120 *Mechanics of Materials (Fall)*
- ME 3210 *System Dynamics (Spring)*
- EE 3310 *Electronic Devices and Circuits & Lab (Spring)*
- ME 3360 *Heat Transfer*
- ME 3600 *Experimental Measurements and Instrumentation & Lab (Fall)*
- ME 4140 *Mechanical Design I (Spring)*
- ME 4620 *Mechanical and Materials Lab (Fall/Spring)*
- ME 4910/4920 *Capstone Design I & II (Fall/Spring)*
- ME 4940 *Mechanical and Materials Engineering Internship (Summer)*

Research Interests

- Advanced/Additive Manufacturing (AM): Nanoimprint lithography, 3D molding, carbon nanotubes (CNTs), miniaturized ratchets/asymmetric structures, and MEMS.
- Micro/nanofluidics: Two-phase flow in micro- and nanoscale porous media analogs (micro/nanomodel), enhanced micro/nano scale heat transfer, self-propelled liquid motion, Leidenfrost phenomenon, superhydrophobic surface and water repellency, computational microfluidics using ANSYS/COMSOL Multiphysics, and BioMEMS.
- Artificial Intelligence/machine learning: hardware implementation of AI, supervised learning, reinforcement/deep learning, control, automation, mechatronics, and biomechanics.

Research Grants

- Innovation in Biological Instrumentation through Design and Engineering: Project I. **PI**
Thermal Choice Chamber, Intramural Grant Awards 2017 (\$5,545.43).
- Acquisition of CNC Micromilling Workstation Capability at Midwestern State **PI**
University, 2017 NSF Major Research Instrumentation Program (\$168,825) *not funded*.
- Computational Micro- and Nanofluidics using COMSOL Multiphysics: Microfluidics **PI**
Module, Internal Faculty Research Grant Awards (\$4,975, by Aug. 31. 2014).
- Film-boiling Liquid Motion on Asymmetric Ratchets, Internal Faculty Research Grant **PI**
Awards (\$1500, Oct. 25, 2013).

Refereed Journal Publications

- **Micro- and nanofluidics**

1. **Jeong Tae Ok**, Eugene Lopez-Ona, Dimitris Nikitopoulos, Harris Wong, Sunggook Park, 2011, “Propulsion of droplets on micro- and sub-micron ratchet surfaces in the Leidenfrost temperature regime”, *Microfluid. Nanofluid.* (**Impact factor: 2.540**) 10 (5), pp. 1045–1054 Cited: 54
2. Qihua Wu, **Jeong Tae Ok**, Yongpeng Sun, S. T. Retterer, Keith B. Neeves, Xiaolong Yin, Bai Baojun, Yinfa Ma, 2013, “Optic imaging of single and two-phase pressure driven flow in nano-scale channels” *Lab Chip* (**Impact factor: 6.799**) 13, pp. 1165–1171 Cited: 26
3. **Jeong Tae Ok**, Junseo Choi, Emily Brown, and Sunggook Park, 2016, “Effect of Different Fluids on Rectified Motion of Leidenfrost Droplets on Micro/Sub-Micron Ratchets” *Microelectronic Engineering* (**Impact factor: 2.523**) 158, pp. 130-134 Cited: 8

- **Advanced manufacturing**

4. Kim, D. W., **Ok, J.T.**, Choi, S. S., Chun, C. K., Kim, J. W., Boo, J. H., 2004, “Analysis of the aperture formation mechanism in the fabrication process of nano-aperture arrays”, *Microelectronic Engineering* (**Impact factor: 2.523**) 73–74, pp. 656–661 Cited: 10
5. S.S. Choi, **J. T. Ok**, D.W. Kim, M.J. Jung, and M.J. Park, 2004, “Modeling of a Nanoscale Oxide Aperture Opening for a NSOM Probe”, *J. Korean Phys. Soc.* (**Impact factor: 0.418**) 45, 1659-1663 Cited: 20
6. J.W. Kim, J.S. Moon, D.W. Kim, M.Y. Jung, **J.T. Ok**, S.S. Choi, H.J. Lim, J.S. Yang, J. H. Boo, 2006, “NEMS fabrication of metal coated sub-wavelength size aperture array and its optical characterization”, *Thin Solid Films* (**Impact factor: 2.183**) 506–507, pp. 225–229 Cited: 2

- **Nanotechnology**

7. Charan Masarapu, **Jeong Tae Ok**, Bingqing Wei, 2007, “Thermal stability of carbon-nanotube-based field emission diodes”, *J. Phys. Chem. C (Impact factor: 4.126)* 111, pp. 12112–12115 Cited: 10
8. Steven M. Hurst, Bahador Farshchian, Lance Brumfield, **Jeong Tae Ok**, Junseo Choi, Jinsoo Kim, and Sunggook Park, 2013, “Low Cost Fabrication of A Superhydrophobic V-Grooved Polymer Surface”, *J. Nanosci. Nanotechnol. (Impact factor: 1.354)* 13, pp. 1884-1887 Cited: 3

- **Petroleum Engineering**

9. Qihua Wu, Bai Baojun, Yinfu Ma, **Jeong Tae Ok**, Keith B. Neeves, Xiaolong Yin, 2014, “Optic imaging of two-phase flow behavior in one dimensional nano-scale channels” *SPE Journal (2019 Impact factor: 3.478)*, SPE-164549-PA Cited: 53
10. Xu Wei, **Jeong Tae Ok (Co-First author)**, Feng Xiao, Xiaolong Yin, Keith Neeves, 2014, “Effect of pore geometry and interfacial tension on water-oil displacement efficiency in oil-wet microfluidic porous media analogs” *Phys. Fluids (Impact factor: 3.521)* 26, 093102 Cited: 59
11. Mahmoud Elsharafi, Cody Chancellor, Connor Kirby, and **Jeong Tae Ok**, 2016, "Hydrochloride Acid Effect on the pH Value of the Superabsorbent Polymer (SAP) Solutions" *Int J Petrochem Sci Eng. 1(1):00006*.

- **Heat Transfer**

12. Colton Dorion, William Hendrickson, Kennan Marion, Kevin Tracy, Charles Watson, and **Jeong Tae Ok**, “Development of a Lizard PBT Data Collection Apparatus” *HardwareX (Impact factor: 3.240)*. under revision
13. Sheldon Wang, Sunggook Park, **Jeong Tae Ok**, “A simplified Model for the Study of Film Boiling Droplet Motion on Micro Scale Ratchets” *Fluids (Impact factor: 1.810)* in prep

Refereed International Conference Proceedings

1. In-Hyounk Song, **Jeong Tae Ok**, Byoung Hee You, and Kendalle Howard, “Acoustic Pressure Analysis of Capacitive Micromachined Ultrasonic Transducer Devices”, *2022 Proceedings of the ASME International Mechanical Engineering Congress & Exposition*, October 30-November 3, Columbus, OH, USA, IMECE2022-96904 abstract accepted.
2. Zeki Ilhan, **Jeong Tae Ok**, Brandon Eakins, Clayton Masters, Kelcee Thompson, and Toyja Vital, “Design and implementation of a pulley-based movable LED system for optimal plant growth”, *2020 Proceedings of the ASME International Mechanical Engineering Congress & Exposition*, November 16-19, Portland, OR, USA, IMECE2020-24089.
3. Connor Kirby, Cody Chancellor, Mahmoud Elsharafi, and **Jeong Tae Ok**. "Control pH Value for Superabsorbent Polymers (SAPS) Solutions by using Hydrochloride Acid

(HCL)", 2016 63rd Annual Southwestern Petroleum Short Course (ASPSC), April 20-21, Lubbock, TX, USA.

4. **Jeong Tae Ok**, Daniel Sang-Won Park, and Sunggook Park, "Effect of surface temperature on the Leidenfrost drop on micro-ratchets", *2015 Proceeding of the MicroTAS (Micro Total Analysis Systems)*, October 25-29, Gyeongju, Korea, 1038-1040, M244d.
5. **Jeong Tae Ok** and Sunggook, "The influence of micro scale ratchet depth on the motion of Leidenfrost drop", *2015 Proceedings of the ASME International Mechanical Engineering Congress & Exposition*, November 13-19, Houston, TX, USA, IMECE2015-51922.
6. **Jeong Tae Ok**, Daniel Sang-Won Park, Sunggook Park, "Leidenfrost liquid drops on miniaturized ratchets: the influence of drop impact speed", *2014 Proceeding of the MicroTAS (Micro Total Analysis Systems)*, October 26-30, San Antonio, TX, USA, 1226-1228, T.292c.
7. Lei Wang, Elham Parsa, Yuefeng Gao, **Jeong Tae Ok**, Keith B. Neeves, Erdal Ozkan, Xiaolong Yin, "Experimental Study and Modeling of the Effect of Nanoconfinement on Hydrocarbon Phase Behavior in Unconventional Reservoirs", *2014 SPE Western North America and Rocky Mountain Joint Conference and Exhibition*, April 16-18, 2014, Denver, CO, USA, 14WRRM-P-233-SPE.
8. Wei Xu, **Jeong Tae Ok**, J.B. Chen, Keith B. Neeves, and Xiaolong Yin, "The effect of pore geometry on displacement efficiency in water and surfactant flooding studied by PDMS microfluidics porous media analogs", *12th National Conference on Fluid Flow in Porous Media*, August 8-9, 2013, Qingdao, China.
9. **Jeong Tae Ok**, Xialong Yin, Qihua Wu, Baojun Bai, Yinfu Ma, and Keith Neeves, "Optic Imaging of Two-phase Flow Behavior in Nano-scale Fractures" *2013 SPE Unconventional Resources Conference – USA*, Apr 10-12, 2013, The Woodlands, TX, USA, SPE164549.
10. Sunggook Park, **Jeong Tae Ok**, Jinsoo Kim, "Effect of Liquids on Leidenfrost Droplet Motion on Micro/Nanoscale Ratchets", *ICNST 2012 (International Conference on Nano Science and Nano Technology)*, Gwangju, Korea, Nov. 8-9, 2012, Nano Energy, S04-1016.
11. Lance Brumfield, **Jeong Tae Ok**, Sunggook Park, "Pool Boiling Enhancement Via Micro Ratchets", *2011 Proceedings of the ASME International Mechanical Engineering Congress & Exposition*, November 11-17, Denver, USA, IMECE2011-63736.
12. **Jeong Tae Ok**, Bahador Farshchian, Daniel Sang-Won Park, Sunggook Park, "The influence of ratchets dimension and shape on the motion of Leidenfrost droplet", *2010 Proceedings of the ASME International Mechanical Engineering Congress & Exposition*, November 12-18, Vancouver, British Columbia, Canada, IMECE2010-37986.
13. Bahador Farshchian, **Jeong Tae Ok**, Steven Maxwell Hurst, Sunggook Park, "Simple Fabrication of Hierarchical Structures on a Polymer Surface", *NSTI (Nano Science and Technology Institute) Nanotech 2010*, June 21-24, Anaheim, USA (cited in 2 publication).
14. Bahador Farshchian, **Jeong Tae Ok**, Jaejong Lee, Sunggook Park, "3-D integration of micro-gratings into bio-analytical devices", *2009 Proceedings of the ASME International*

Mechanical Engineering Congress & Exposition, November 13-19, Lake Buena Vista, FL, USA, IMECE2009-11934.

15. **Jeong Tae Ok**, Eugene Lopez-Ona, Harris Wong, Sunggook Park, “Effect of surface wetting of micro/nano ratchets on Leidenfrost liquid drop motion”, *2009 Proceedings of the ASME 7th International Conference on Nanochannels, Microchannels and Minichannels*, June 22-24, Pohang, South Korea, ICNMM2009-82173.
16. **Jeong Tae Ok**, Eugene Lopez-Ona, Daniel Sang-Won Park, Harris Wong, Sunggook Park, “Fabrication of 3-D superhydrophobic micro-ratchets via combined thermal imprint lithography and photolithography”, *2008 Proceedings of the ASME International Mechanical Engineering Congress & Exposition*, October 31-November 6, Boston, USA, IMECE2008-67880.
17. **Jeong Tae Ok**, Eugene Lopez-Ona, Harris Wong, Sunggook Park, “Leidenfrost liquid droplets on micro/nano ratchets”, *2008 Proceeding of the MicroTAS (Micro Total Analysis Systems)*, October 12-16, San Diego, USA, pp. 1672-1674.
18. **J.T. Ok**, S.S. Choi, D.W. Kim, C.K. Chun, J.W. Kim, J.H. Boo, “Nanofabrication of Sub-Wavelength size Aperture Array For Near field Optical Probe Array”, *Proceeding of the IEEE-NANO 2003*, August 12-14, San Francisco, USA, 832-835.
19. Seong S. Choi, **J.T. Ok**, D.W. Kim, J.H. Boo, “Nanofabrication of Al-coated Oxide Aperture for NSOM Using Isotropic Etching Technique”, *2003 AIP Conference Proceedings*, July 21-25, Eindhoven, Netherland, 696(1): 336-342.

Refereed Abstracts for Oral/Poster Presentations

1. Zeki Ilhan, Johnny Cognasi, Jason Perkins, Joseph Randall, Melanie Ronoh, and **Jeong Tae Ok**, “Design and Implementation of a pulley-based movable LED system”, 2019 Undergraduate Research and Design Expo of the ASME International Mechanical Engineering Congress & Exposition, November 11-14, Salt Lake City, Utah, USA, IMECE2019-11602.
2. **Jeong Tae Ok**, Colton Dorion, William Hendrickson, Kennan Marino, Kevin Tracy, Salim Azzouz, Yu Guo, and Charls Watson, “Development of a Lizard PBT Data Collection Apparatus” *2018 Poster Presentation of the ASME International Mechanical Engineering Congress & Exposition*, November 9-15, Pittsburgh, PA, USA, IMECE2018-88809.
3. **Jeong Tae Ok**, Janith Ambewela, Timothy Biggs, Xitong Li, Corbin Whan, Paul Yacho, and Sheldon Wang, “Design and Implementation of a Convective Heat Transfer Coefficient Measurement System” *2017 Poster Presentation of the ASME International Mechanical Engineering Congress & Exposition*, November 3-9, Tampa, FL, USA, IMECE2017-71446.
4. **Jeong Tae Ok**, Xiaolong Yin, and Keith B. Neeves, “Two-phase Flow in Micro- and Nanoscale Porous Media for Petroleum Application” *2017 Poster Presentation of the ASME International Mechanical Engineering Congress & Exposition*, November 3-9, Tampa, FL, USA, IMECE2017-72265.

5. Kiran Chapagain, Daniel Goodey, Yu Guo, Mahmoud Elsharafi, **Jeong Tae Ok**, Sunggook Park, and Sheldon Wang, "Modeling Study of the Leidenfrost Drop on the Miniaturized Ratchets" *2016 US-Korea Conference on Science, Technology and Entrepreneurship (UKC 2016)*, August 10-13, Dallas, TX, G4593.
6. **Jeong Tae Ok**, Kiran Chapagain, Daniel Goodey, Ayesha Madamwatta, Eurydice Kanimba, Mahmoud Elsharafi, Yu Guo, Sheldon Wang, and Sunggook, "Modeling study of Leidenfrost liquid drops moving on surfaces with micro- and nano-scale ratchets", *2016 Technical Presentation of the ASME International Mechanical Engineering Congress & Exposition*, November 11-17, Phoenix, AZ, USA, IMECE2016-68160.
7. Cody Chancellor Connor Kirby, Mahmoud Elsharafi, and **Jeong Tae Ok**, "Kinetics of a Super-Absorbent Polymer", *2016 SPE Southwestern North America Student Paper Contest*, April 2, The University of Texas at Austin, TX. **4th ranked**.
8. **Jeong Tae Ok**, Bahador Farshchian, Lance Brumfield, Junseo Choi, and Sunggook Park, "Directional Rebounding of Water Drop on PMMA Superhydrophobic Ratchets", *41st Micro and Nano Engineering*, September 21-24, 2015, Hague, Netherlands.
9. **Jeong Tae Ok** and Sunggook Park, "Effect of Different Fluids on Rectified Motion of Leidenfrost Droplets on Micro/Sub-Micron Ratchets", *41st Micro and Nano Engineering*, September 21-24, 2015, Hague, Netherlands.
10. Joanna Sylman, **Jeong Tae Ok**, and Keith B. Neeves, "A microelectrode heating model of vascular injury to study nitric oxide-platelet interactions", Biomedical Engineering Society (BMES) Annual Meeting, September 25-28, 2013 in Seattle, Washington.
11. Yinfa Ma, Qihua Wu, Baojun Bai, **Jeong Tae Ok**, Yongpeng Sun, Xiaolong Yin, Keith Neeves, "Optical imaging of gas/water two phase flow behavior in nanochannels using single molecule imaging system", 2013 25th American Chemical Society National Meeting, April 7-11, New Orleans, LA.
12. Qihua Wu, Baojun Bai, Yinfa Ma, **Jeong Tae Ok**, Yongpeng Sun, Xiaolong Yin, and Keith Neeves, "Bisualization of gas/water two phase flow and displacement of gas/water in nanochannels using single molecule imaging system", 2013 Pittsburgh Conference, March 17-21, Philadelphia, PA.
13. Wei Xu, **Jeong Tae Ok**, Keith B. Neeves, and Xiaolong Yin, "Water-Oil Drainage Dynamics in Oil-Wet Random Microfluidic Porous Media Analogs", APS Physics, Division of Fluid Dynamics, Video Gallery, 2012, Oct. 12, Submission#: 83937.
14. Xiaolong Yin, Wei Xu, **Jeong Tae Ok**, Keith B. Neeves, "Micromodel Study of Influence of Pore Geometry on Water-Oil Displacement with and without Surfactant", American Geophysical Union, Dec. 3-7, 2012, San Francisco, USA, H53G-1606.
15. Wei Xu, **Jeong Tae Ok**, Keith B. Neeves, Xiaolong Yin, "Visualization of Water flooding and formation damage in micro- and nanofluidic porous media analogs", The Flow & Transport in Permeable Media Gordon Research Conference, Les Diablerets, Switzerland, June 24-29, 2012.

16. Wei Xu, **Jeong Tae Ok**, Keith B. Neeves, Xiaolong Yin, “Visualization of waterflooding and formation damage / water retention on PDMS-based microfluidic micromodels”, Conference on Earth & Energy Research 2012, Until the Last Drop: Enhanced Oil Recovery, Colorado School of Mines, Golden, CO, March 29, 2012, pp 128
17. **Jeong Tae Ok**, “Leidenfrost droplets on micro/nano ratchets”, *2010 ME Annual Graduate Student Conference*, Louisiana State University, Baton Rouge, April 10, 2010, pp. 11-12.
18. **Jeong Tae Ok**, Eugene Lopez-Ona, Harris Wong, Sunggook Park, “Liquid motion on micro/nanoscale ratchet surfaces in the film-boiling regime”, *FAAM (First American Academy of Mechanics) conference 2008*, New Orleans, USA, June 17-20, 2008, Microfluidics: Fundamentals and Applications 190183.
19. **Jeong Tae Ok**, Eugene Lopez-Ona, Harris Wong, Sunggook Park, “Self-propelled Liquid Motion on Micro-/Nanometer Scale Ratchet Surfaces”, *NSTI (Nano Science and Technology Institute) Nanotech 2008*, June 2-5, Boston, USA, Micro & Nano Fluidics WE80.203.
20. Bingqing Wei, Abhilash Krishna, **Jeong Tae Ok**, “Effects of Physical Layout Temperature and Pressure on Field Emission Properties of Carbon Nanotubes”, *Nanodevices and Nanofabrication 2005*, Singapore, July 3-8, 2005.
21. S.S. Choi, **J.T. Ok**, M.Y. Jung, D.W. Kim, “Fabrication of Metal Coated Sub-Wavelength size Aperture Array and Its Optical Characterization”, *The Korean Physical Society '03*, Yonsei University, Seoul, South Korea, April 25-26, 2003.
22. **J.T. Ok**, E.S. Kim, “Programmable Analog-Pulse Neural Networks”, *Korea Information Science Society '97*, Sun Moon University, Asan, Chungnam, South Korea, Dec. 5-6, 1997.
23. **J.T. Ok**, E.S. Kim, “Hardware Implementation of Analog-Pulse Neural Networks and the Characterization”, *JCEANF '97*, Korea University, Seoul, South Korea, Jun 20, 1997.

Invited Book Chapters

1. **Jeong Tae Ok**, Keith B. Neeves, Wei Xu and Xiaolong Yin, Chapter 8. Microfluidic and Nanofluidic Porous Media Analogs for Oil and Gas Applications in *Pore Scale Phenomena: Frontiers in Energy and Environment* edited by Hohn Poate, Tissa Illangasekare, Hossein Kazemi, Robert Kee, World Scientific, pp. 135-146, Jun. 2015.

Articles Posted on E-printed Servers

1. Wei Xu, **Jeong Tae Ok**, Keith B. Neeves, and Xiaolong Yin, “Water-Oil Drainage Dynamics in Oil-Wet Random Microfluidic Porous Media Analogs”, arXiv:12104425, 2012.

Previous and Ongoing Undergraduate Research Projects

1. Film-boiling Liquid Motion on Asymmetric Ratchets: Influence of Ratchet Material and Aspect Ratio, 2014 Spring EURECA, and COSM Faculty Research Award.

2. Solar Stirling Dish Engine Energy Harvesting Panel, 2013-2014 Senior Design Project with Dr. Salim Azzouz and Mr. Mark Weller (Students: Wade Courtney, Chard Davis, Mallory Goon, Richard Rizan).
3. Computational Micro- and Nanofluidics using COMSOL Multiphysics: Microfluidics Module, Internal Faculty Research Grant Awards (\$4,974, by Aug. 31. 2014).
4. Development of Image Processing tool for Leidenfrost-Ratchets Systems, Spring 2014 and 2015 with Drs. Catherine V. Stringfellow and Yu Guo.
5. Computational Study of Film Boiling Droplet Motion in Micro- and Nanoscale Ratchets, 2015 Spring, Fall and 2016 Spring EURECA, and 2016 UGROW with Drs. Yu Guo, Mahmoud Elsharafi, and Sheldon Wang (Students: Ayesha Madamwatta, Eurydice Kanimba, Daniel Goodey, Kiran Chapagain, Chiedza Tokonyai, and Corbin Matamoros).
6. Oilfield Waters shut-off Treatment in mature reservoir by using Superabsorbent Polymer and Various Brine Concentrations, 2015 Spring and Fall EURECA with Dr. Mahmoud Elsharafi (Students: Cody L. Chancellor and Conner Kirby).
7. Enhanced Oil Recovery using Micro Porous Media Analogs (uPMAs), 2015-2016 Senior Design Project with Dr. Mahmoud Elsharafi (Students: Matthew Felix, Matthew Murphy, Cecil Francis, and Dewalawaga Ayesha).
8. Viscosity Measurements for Various Fluids Used in Oil Industry, 2016 Spring EURECA with Dr. Mahmoud Elsharafi (Students: Denzel Kinyua and Kentzie Rhodes).
9. Evaluate the Effect of pH on the Mixed Brine and Chemical Solutions, 2016 Spring EURECA with Dr. Mahmoud Elsharafi (Students: Cody Chancellor, Connor Kirby and Jenom Pyeng).
10. Development of image processing tool for the study of two phase flow in micro- and nanoscale porous media analogs (nPMAs/uPMAs), Spring 2016 with Dr. Eduardo Colmenares-Diza and Dr. Yu Guo (Students: Austin Cullar, Taylor Murphy, Kem Andrew).
11. Measurement and Visualization of Convective Heat Transfer Mechanism via the Superheated Cavitation 2016-17 Senior Design Project with Dr. Sheldon Wang (Students: Janith Ambewela, Timothy Biggs, Xitong Li, Corbin Whan, and Paul Yacho)
12. Dynamic Contact Angle Measurements, 2017 Spring and Fall EURECA with Dr. Mahmoud Elsharafi (Students: Omar Clarke, Jomarie Leblanc, and Sheldon Walsh).
13. Enhanced Oil Recovery (EOR) Study using Stiff Polymer Micro Porous Media Analogs (μ PMAs), 2017 Fall EURECA (Students: Carlyse Wallace and Juwell Williams).
14. Design and Implementation of Apparatus to Investigate Preferred Body Temperature (PBT) of Diverse Lizards, 2017-2018 Senior Design Project and 2017 Intramural Awards with Drs. Charles Matthew Watson, Yu Guo, and Salim Azzouz (Students: Colton Dorion, William Hendrickson, Kennan Marino, and Kevin Tracy).

15. Robot Soccer using Artificial Intelligence, 2017-2019 Spring and Fall EURECA with Drs. Yu Guo and Bingyang Wei (Students: Mpathi Nzima, Joshua Washington, Carson Conrady, Garrett Syrus, Kuwin Wyke, Jhymani Joseph, and Trever Snyder).
16. A Pulley Based Movable LED System for Plant Growth, 2018-2019 Senior Design Project with Dr. Zeki Ilhan and Block Division Inc. (Students: Johnny Cognasi, Jason Perkins, Joseph Randall, and Melanie Ronoh).
17. Parametric Study of a Convective Heat Transfer Coefficient Measurement System, 2019-2020 Senior Design Project (Kyndal Diehm, Jacob Hawkins, Vincent Johnson, and Jackson Strieby).
18. Optimization of the Vertical Position of a Pulley-Based LED Light Source to Plant Productivity via Automation, 2019-2020 Senior Design Project (Students: Brandon Eakins, Clayton Masters, Kelcee Thompson, and Tojya Vital).
19. Implementation of a Smart Robotic Pool Cleaner, 2021-2022 Capstone Design Project (Students: AJ Ahrens, Clayton Heitkamp, Mike Hoying, Alex Partington, and Koby Paul).

Awards and Leadership Activities

1. Mentored postdocs, graduate, undergraduate, and high school students for 10+ years.
2. Graduate Student Conference Organizing Committee of 2011 Louisiana State University Mechanical Engineering Graduate Student Conference, April, 2011.
3. NSF fellowship for the Short Course on “Inspiring the Coalescence of Fundamental and Application Specific Functional Nanomaterial Development”, Northwestern University, July 9-12, 2007 (\$2,000 tuition waived).
4. Supplement Award from graduate school, Louisiana State University, 2004-2005 (\$3000).
5. Higher Education National Scholarship Award for students related Science and Technology, 2003 Fall Semester, from Korea Research Foundation (KRF) (~\$2000).
6. The best presentation award of the Semiconductor Process Course at Inter-University Semiconductor Research Center (ISRC), Seoul National University, May 2003.
7. President of Korean Student Association of Louisiana State University, Aug. 2006 – July. 2007.
8. President of Korean Tennis Club of Louisiana State University, Jan. 2005 – Jan. 2006.
9. Korean Marine Officer, infantry platoon leader, firearms company leader, and infantry battalion executive officer, Pohang and Ganghwa, Republic Korea, March 1999 – June 2002.
10. Sun Moon University amateur basketball team captain, 1993.
11. Sun Moon University amateur soccer team captain, 1992.
12. Korean national junior representative swimmer, 1985-1986.

Membership in Professional Societies

- American Society of Mechanical Engineers (**ASME**)
- American Society of Engineering Education (**ASEE**)
- Korean-American Scientists and Engineers Associations (**KSEA**)
- Coach Member of USA Swimming (**USSA**)

Professional Activities and Service

- Technical Reviewers (32 proceedings), Topic (Micro and Nano Devices) Co-Organizer, and Session Co-Chair in Track 13: Micro- and Nano-Systems Engineering and Packaging for the ASME IMECE 2016 -2020.
- Korean-American Scientists and Engineers Associations (**KSEA**) board member, 2018 Spring – Current.
- Coordinator of North Texas Chapter for the 2018 National Mathematics & Science Competition on April, 2018.
- Reviewer of Applied Physics Letters (*Appl. Phys. Lett*, Impact Factor: 3.521 in 2018) by the American Institute of Physics (AIP), Colloids and Surfaces A: Physicochemical and Engineering Aspects (*Colloids Surf. A*, Impact Factor: 3.131 in 2018) by ELSEVIER, Journal of Vibration Testing and System Dynamics by L & H Scientific Publishing, IEEE Sensors Journal (*IEEE Sens. J.*, Impact Factor: 3.076 in 2019) by IEEE, and Journal of Electrochemical Energy Conversion and Storage (*J. Electrochem. En. Conv. Stor.*, Impact Factor: 1.515 in 2019) by ASME.

Military Service and Volunteering Leadership Experience	
	<ul style="list-style-type: none"> • Korea Marine Officer: infantry platoon leader, firearm company leader, infantry battalion tactic aide/executive officer, Pohang and Ganghwa, Republic Korea, March 1999-June 2002, full time.
	<ul style="list-style-type: none"> • Certified United States Swim & Tennis Coach at Wichita Falls Elite Swim Team (WEST) & Lima YMCA, Lima Shawnee High School, Sep. 2015-Present, part time (1.5-2 hours/day and 3-5 days/week).