

**JOHN P. NUSZKOWSKI, Ph.D.**

University of North Florida (UNF)

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Jacksonville, FL 32224

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**EDUCATION**

**West Virginia University, Morgantown, WV**

Major: Mechanical Engineering

Degree: Doctorate of Philosophy, August 2008

Dissertation Chair: Gregory J. Thompson, Ph.D.

Dissertation: The Effects of Fuel Additives on Diesel Engine Emissions during Steady State and Transient Operation

**West Virginia University, Morgantown, WV**

Major: Mechanical Engineering

Degree: Master of Science, August 2005

Thesis Chair: Gregory J. Thompson, Ph.D.

Thesis: Staten Island Ferry Emissions Reduction

**Rochester Institute of Technology, Rochester, NY**

Major: Mechanical Engineering

Degree: Bachelor of Science, May 2003

**EMPLOYMENT HISTORY**

**University of North Florida, Mechanical Engineering Program, Jacksonville, FL**

Associate Professor 8/2017 – present

Teach mechanical engineering courses, acquire project funding, and write proposals, publications and conference papers on research topics.

**University of North Florida, Mechanical Engineering Program, Jacksonville, FL**

Assistant Professor 8/2011 – 8/2017

Teach mechanical engineering courses, acquire project funding, and write proposals, publications and conference papers on research topics.

**West Virginia University, Department of Mechanical and Aerospace Engineering, Morgantown, WV**

Research Adjunct Professor 08/2011 – present

Research heavy-duty vehicle and engine performance and emissions.

**West Virginia University, Department of Mechanical and Aerospace Engineering,  
Morgantown, WV**

Research Assistant Professor 12/2008 – 7/2011

Research heavy-duty vehicle and engine performance and emissions. Acquire project funding and write proposals, publications and conference papers on research topics.

**West Virginia University, Department of Mechanical and Aerospace Engineering,  
Morgantown, WV**

Project Coordinator 08/2008 – 10/2008

Research diesel engine emissions, write reports and papers on research topics.

**West Virginia University, Department of Mechanical and Aerospace Engineering,  
Morgantown, WV**

Graduate Research Assistant 08/2003 – 07/2008

Research diesel engine emissions, write reports, and papers on research topics. Provide support to research programs.

**General Electric - Power Systems, Schenectady, NY**

Controls Engineer, Intern 09/2002 – 11/2002

Research problems, research new ideas, write reports, and update gas turbine controls code and documentation.

**General Electric - Power Systems, Schenectady, NY**

Mechanical Engineer, Intern 03/2002 – 05/2002

Design and research of steam turbine parts in the new product introduction department.

**Laerdal Medical Corporation, Wappingers Falls, NY**

Mechanical Design Engineer, Intern 09/2001 – 11/2001

Conceived innovative products for emergency medicine. Testing and shop experience.

**Gleason Works, Rochester, NY**

CAD Applications Engineer, Intern 03/2001 – 05/2001

Modeled parts and assemblies using Pro-Engineer. Create tutorials and one-on-one help based on Pro-Engineer.

**General Electric - CRD, Schenectady, NY**

Mechanical Engineer, Intern 06/2000 – 11/2000

Responsible for laboratory facility, testing, data acquisition, and preliminary theories based on data.



## RESEARCH AREAS

- Vehicle and engine performance
- Internal combustion engine emissions
- Alternative fuels
- Thermodynamic Systems

## INSTRUCTION

Summer Semester, 2017, UNF, Internal Combustion Engines, EML 6933, Enrollment 1.

Summer Semester, 2017, UNF, Internal Combustion Engines, EML 4421, Enrollment 21.

Spring Semester, 2017, UNF, Thermodynamics II, EML 3101, Enrollment 52.

Spring Semester, 2017, UNF, Energy Systems Lab, EML 4004L, Section 1, Enrollment 14.

Spring Semester, 2017, UNF, Energy Systems Lab, EML 4004L, Section 2, Enrollment 11.

Fall Semester, 2016, UNF, Introduction to Engineering I, ENG 1001C, Enrollment 48.

Fall Semester, 2016, UNF, Introduction to Engineering I, ENG 1001C, Enrollment 47.

Fall Semester, 2016, UNF, Machine Design, EML 4501, Enrollment 32.

Fall Semester, 2016, UNF, Thermodynamics I, EML 3100, Enrollment 72.

Summer Semester, 2016, UNF, Internal Combustion Engines, EML 4421, Enrollment 23.

Spring Semester, 2016, UNF, Thermodynamics II, EML 3101, Enrollment 64.

Spring Semester, 2016, UNF, Introduction to Engineering I, ENG 1001C, Enrollment 48.

Spring Semester, 2016, UNF, Introduction to Engineering I, ENG 1001C, Enrollment 40.

Fall Semester, 2015, UNF, Machine Design, EML 4501, Enrollment 61.

Fall Semester, 2015, UNF, Thermodynamics I, EML 3100, Enrollment 40.

Fall Semester, 2015, UNF, Introduction to Engineering I, ENG 1001C, Enrollment 48.

Summer Semester, 2015, UNF, Thermodynamics I, EML 3100, Enrollment 17.

Spring Semester, 2015, UNF, Thermodynamics II, EML 3101, Enrollment 64.

Spring Semester, 2015, UNF, Internal Combustion Engines, EML 4930, Enrollment 16.

Spring Semester, 2015, UNF, Internal Combustion Engines, EML 6933, Enrollment 1.

Spring Semester, 2015, UNF, Introduction to Engineering II, ENG 2009, Enrollment 14.

Fall Semester, 2014, UNF, Thermodynamics I, EML 3100, Enrollment 75.

Fall Semester, 2014, UNF, Introduction to Engineering II, ENG 2009, Enrollment 47.

Summer Semester, 2014, UNF, Energy Efficient Vehicles, EML 4930, Enrollment 20.

Spring Semester, 2014, UNF, Thermodynamics II, EML 3101, Enrollment 74.

Spring Semester, 2014, UNF, Internal Combustion Engines, EML 4930, Enrollment 15.

Spring Semester, 2014, UNF, Internal Combustion Engines, EML 6933, Enrollment 4.

Spring Semester, 2014, UNF, Introduction to Engineering II, ENG 2009, Enrollment 35.

Fall Semester, 2013, UNF, Machine Design, EML 4501, Enrollment 50.

Fall Semester, 2013, UNF, Thermodynamics I, EML 3100, Enrollment 64.

Fall Semester, 2013, UNF, Introduction to Engineering II, ENG 2009, Enrollment 47.

Summer Semester, 2013, UNF, Thermodynamics I, EML 3100, Enrollment 48.

Spring Semester, 2013, UNF, Thermodynamics II, EML 3101, Enrollment 57.

Spring Semester, 2013, UNF, Internal Combustion Engines, EML 4930, Enrollment 18.

Spring Semester, 2013, UNF, Internal Combustion Engines, EML 6933, Enrollment 2.

Fall Semester, 2012, UNF, Introduction to Engineering II, ENG 2009, Enrollment 42.

Fall Semester, 2012, UNF, Machine Design, EML 4501, Enrollment 38.

Fall Semester, 2012, UNF, Thermodynamics I, EML 3100, Enrollment 39.

Summer Semester, 2012, UNF, Applied Vehicle Powertrain, EML 4930, Enrollment 15.

Summer Semester, 2012, UNF, Sustainable Engineering Design, CGN 4931, Enrollment 8.

Spring Semester, 2012, UNF, Energy Systems Lab, EML 4004L, Section 1, Enrollment 26.

Spring Semester, 2012, UNF, Energy Systems Lab, EML 4004L, Section 2, Enrollment 26.

Spring Semester, 2012, UNF, Thermodynamics II, EML 3101, Enrollment 37.

Fall Semester, 2011, UNF, Introduction to Engineering II, ENG 2009, Enrollment 75.

Fall Semester, 2011, UNF, Machine Design, EML 4501, Enrollment 60.

Fall Semester, 2011, UNF, Thermodynamics I, EML 3100, Enrollment 41.

Spring Semester, 2011, WVU, Thermodynamics, MAE 320, Enrollment 50.

Fall Semester, 2010, WVU, Thermodynamics, MAE 320, Enrollment 39.

Fall Semester, 2010, WVU, Machine Design and Manufacturing, MAE 454, Enrollment 22.

Fall Semester, 2007, WVU, Machine Design and Manufacturing, MAE 454, Enrollment 27.

## **INVITED TALKS**

“An Experimental Investigation of the Thermal Efficiency, Combustion Process, and Emissions of a Heavy-Duty Diesel Engine Enriched with Hydrogen (H<sub>2</sub>),” UNF ASME Chapter, February 12, 2013.

“Engine and Powertrain Research,” UNF ASME Chapter, January 18, 2013.

“Locomotive Emissions Measurement,” Fall Semester, 2010, WVU, Heavy Duty Vehicle Emissions, MAE 525 (Graduate Course), Enrollment 19.

“Chemical Kinetics,” Spring Semester, 2010, WVU, Advanced Thermodynamics 2, MAE 621 (Graduate Course), Enrollment 13.

“In-cylinder Convection Heat Transfer,” Spring Semester, 2010, WVU, Advanced Internal Combustion Engines, MAE 593Q (Graduate Course), Enrollment 27.

“In-cylinder Pressure Measurement,” Fall Semester, 2009, WVU, Engine Combustion and Emissions, MAE 493H, Enrollment 8.

“Staten Island Ferry Emissions Reduction,” Spring Semester, 2007, WVU, Conventional and Hybrid Vehicle Emissions, MAE 593H (Graduate Course), Enrollment 12.

#### **GRADUATE STUDENT THESIS ADVISOR**

Timpanaro, Anthony	MSME (Expected 12/17)
“Selective Non-Catalytic Reduction (SNCR) in a Diesel Engine”	
Kodakoglu, Furkan	MSME (08/17)
“Development of a Linear Expander for Waste Heat Recovery”	
Merritt, Brock	MSME (08/11)
“Juxtaposition of In-Use Vehicular Emissions Measurement Equipment”	
Morris, Melissa	Ph.D. (08/11)
“Development of an Artificial Neural Network to Predict In-Use Engine Emissions”	
Kimble, Nathan	MSME (08/11)
“Model Based Evaluation of the Differences between Full and Partial Flow Particulate Matter Sampling Systems”	

#### **GRADUATE STUDENT THESIS COMMITTEES**

Ryskamp, Ross	Ph.D. (05/16)
“Investigation of High Reactivity Fuel Property Effects on Reactivity Controlled Compression Ignition Combustion”	
Gamal, Ahmed	MSME (8/15)
“Autonomous Small Scale Data-logger for Temperature Mapping”	
Olatunji, Idowu	MSME (12/10)
“Emissions Characterization and Particle Size Distribution from a DPF-Equipped Diesel Truck Fueled with Biodiesel Blends”	
Ryskamp, Ross	MSME (12/10)
“Exploration of Injection Strategy and Fuel Property Effects on Advanced Combustion”	
Ice, Jason	MSME (12/10)
“Investigation of EGR and Fuel Property Effects on Advanced Combustion Strategies Using In-cylinder Combustion Analyses”	
Balakrishnan, Ramamoorthy	MSME (08/11)
“Investigation of Particulate Matter Size Distribution and Concentration during Low Temperature Combustion”	

## PEER REVIEWED PUBLICATIONS

- Kaisan, M.U., Anafi, F.O., Nuskowski, J., Kulla, D.M. and Umaru, S., "Calorific value, flash point and cetane number of biodiesel from cotton, jatropha and neem binary and multi-blends with diesel," *Biofuels*, pp.1-7, 2017.
- Li, H., Liu, S., Liew, C., Gatts, T., Wayne, S., Clark, N., and **Nuskowski, J.**, "An Investigation of the Combustion Process of a Heavy-Duty Dual Fuel Engine Supplemented with Natural Gas and Hydrogen," *International Journal of Hydrogen Energy*, Vol. 42, No. 5, pp. 3352-3362, 2017.
- **Nuskowski, J.**, Smith, H., McKinney, M., McMahan, N., Wilder, B., Boehringer, E., Clarkson, B., Littleton, C., Parker, K., "On-road Fuel Economy Increase by Trailing at a Safe Distance," *Proc. IMechE, Part D: Journal of Automobile Engineering*, 10.1177/0954407017703233, 2017.
- Kaisan, M.U., Anafi, F.O., **Nuskowski, J.**, Kulla, D.M. and Umaru, S., 2017. Exhaust emissions of biodiesel binary and multi-blends from Cotton, Jatropha and Neem oil from stationary multi cylinder CI engine. *Transportation Research Part D: Transport and Environment*, Vol. 53, pp. 403-414, 2017.
- **Nuskowski, J.**, Schwamb, J., and Esposito, J., "A Novel Gas Divider using Nonlinear Laminar Flow," *Flow Measurement and Instrumentation*, Vol. 52, No. 12, pp. 255-260, 2016.
- **Nuskowski, J.**, McGough, M., Kimes, L., Harris, A., Hudyma, N., and Malhas, F., "Characterization of Weathered Limestone using Thermal Imaging and Split Tension Testing," *International Journal of Modern Engineering*, Vol. 16, N. 1, Fall/Winter, 2015.
- **Nuskowski, J.**, Brown, C. J., Harris, A., and Hansen-Brown, L., "Revisiting Transformational Learning of Millennial College-Age Science and Engineering Students via Experiential Learning Communities," *Journal of Applied Global Research (JAGR)*, Vol. 8, Issue 21, 2015.
- Li, H., Liu, S., Gatts, T., Liew, C., Wayne, S., **Nuskowski, J.**, Thompson, G., and Clark, N., "An Investigation of NO<sub>2</sub> Emissions from a Heavy-Duty Diesel Engine Fumigated with H<sub>2</sub> and Natural Gas," *Journal of Combustion Science and Technology*, Vol. 184, No. 12, pp. 2008-2035, 2012.



- Carder, D., Ryskamp, R., **Nuszkowski, J.**, Li, H., Clark, N., Thompson, G., Gautam, M., and Wayne, S., "Fuels to Enable Light-Duty Diesel Advanced Combustion Regimes," Coordinating Research Council, Inc., August, 2012.
- **Nuszkowski, J.**, Flaim, K., and Thompson, G., "The Effect of Cetane Improvers and Biodiesel on Diesel Particulate Matter Size," SAE International Journal of Fuels and Lubricants, Vol. 4, No. 1, pp. 23-33, 2011.
- Liew, C., Li, H., **Nuszkowski, J.**, Liu, S., Gatts, T., Atkinson, R., and Clark, N., "An Experimental Investigation of the Combustion Process of a Heavy-Duty Diesel Engine Enriched with H<sub>2</sub>," International Journal of Hydrogen Energy, Vol. 35, No. 20, pp. 357-365, 2010.
- Thompson, G. and **Nuszkowski, J.**, "Neat Fuel Influence on Biodiesel Blend Emissions," International Journal of Engine Research, Vol. 11, No. 1, pp. 61-77, 2010.
- **Nuszkowski, J.**, Tincher, R., and Thompson, G., "Evaluation of the NO<sub>x</sub> Emissions from Heavy Duty Diesel Engines with the Addition of Cetane Improvers," Proceedings of the Institution of Mechanical Engineers, Part D: Journal of Automobile Engineering, Vol. 223, No. 8, pp. 1049-1060, 2009.
- **Nuszkowski, J.**, Thompson, G., and Ursic, M., "The Influence of Accelerator Pedal Position Control during Transient Laboratory Testing on Heavy Duty Diesel Engines," SAE International Journal of Engines, Vol. 2, No. 1, pp. 398-404, 2009.
- **Nuszkowski, J.**, Clark, N., Spencer, T., Carder, D., Gautam, M., Balon, T., and Moynihan, P., "Atmospheric Emissions from a Passenger Ferry with Selective Catalytic Reduction," Journal of the Air & Waste Management Association, Vol. 59, No. 1, pp. 18-30, 2009.
- **Nuszkowski, J.**, Spencer, T., Clark, N., and Balon, T., "On-board Emissions Measurement and Characterisation of Marine Diesel Engines," Journal of Marine Design and Operations Proceedings of IMarEST - Part B, No. 11, pp. 15-26, 2007.

#### PEER REVIEWED CONFERENCE PAPERS/PRESENTATIONS

- Ryskamp, R., Thompson, G., Carder, D., and **Nuszkowski, J.**, "The Influence of High Reactivity Fuel Properties on Reactivity Controlled Compression Ignition Combustion," Warrendale, PA, SAE Technical Paper No. 2017-24-0080, 2017.
- **Nuszkowski, J.**, Thomas, A., Hudyma, N., and Harris, A., "Development of a Test Apparatus to Determine Thermal Properties of Rock Specimens," 50th US Rock Mechanics / Geomechanics Symposium held in Houston, Texas, USA, 26-29 June

2016.

- Bonsack, P., Ryskamp, R., Besch, M., Carder, D., Gautam, M., and **Nuszkowski, J.**, “Number Concentration and Size Distributions of Nanoparticle Emissions during Low Temperature Combustion using Fuels for Advanced Combustion engines (FACE),” Warrendale, PA, SAE Technical Paper No. 2014-01-1588, 2014.
- Bonar, H. and **Nuszkowski, J.**, “Gaining “Lost Work” for a Greener Planet,” 5th International Conference, Ammonia Refrigeration Technology (Ohrid, Republic of Macedonia), May 9-11, 2013.
- Littera, D., Bonsack, P., Ryskamp, R., Besch, M., Carder, D., **Nuszkowski, J.**, and Gautam, M., “Concentration and Size Distributions of Nanoparticle Emissions during Low Temperature Combustion using Fuels for Advanced Combustion Engines,” 16<sup>th</sup> ETH Conference on Combustion Generated Nanoparticles (Zurich, Switzerland), June 24-27, 2012.
- Ryskamp, R., **Nuszkowski, J.**, Carder, D., Bonsack, P., and Gautam, M., “Comprehensive Investigation of Fuel Property Effects on Light-Duty Compression Ignition Advanced Combustion” 22<sup>nd</sup> CRC On-Road Vehicle Emissions Workshop (San Diego, California), 2012.
- **Nuszkowski, J.**, Flaim, K., and Thompson, G., “The Effect of Cetane Improvers and Biodiesel on Diesel Particulate Matter Size,” Warrendale, PA, SAE Technical Paper No. 2011-01-0330, 2011.
- Dam, M., **Nuszkowski, J.**, and Thompson, G., “Experimental Investigation into the Effects of Oil Aging on Laboratory Measurement of Emissions from a Heavy-duty Diesel Engine,” Warrendale, PA, SAE Technical Paper No. 2011-01-1163, 2011.
- Clark, N., McKain, D., Sindler, P., Jarrett, R., **Nuszkowski, J.**, Gautam, M., Wayne, S., Thompson, G., and Sonny, R., “Comparative Emissions from Diesel and Biodiesel Fueled Buses from 2002 to 2008 Model Years,” Warrendale, PA, SAE Technical Paper No. 2010-01-1967, 2010.
- Olatunji, I., Clark, N., Sindler, P., McKain, D., Thompson, G., Gautam, M., Wayne, S., and **Nuszkowski, J.**, “Biodiesel Blend Emissions of a 2007 Medium Heavy Duty Diesel Truck,” Warrendale, PA, SAE Technical Paper No. 2010-01-1968, 2010.
- **Nuszkowski, J.** and Thompson, G., “Biodiesel Blend NO<sub>x</sub> Emissions from Heavy Duty Diesel Engines,” 2<sup>nd</sup> International Congress on Biodiesel: The Science and The Technologies, Munich, Germany, November, 2009.

- **Nuszkowski, J.** and Thompson, G., “The Influence of Accelerator Pedal Position Control during Transient Laboratory Testing on Heavy Duty Diesel Engines,” Warrendale, PA, SAE Technical Paper No. 2009-01-0619, 2009.
- **Nuszkowski, J.** and Thompson, G., “Application and Repeatability of Transient Heat Release Analysis for Heavy Duty Diesel Engines,” Warrendale, PA, SAE Technical Paper No. 2009-01-1125, 2009.
- **Nuszkowski, J.**, Thompson, G., Tincher, R., and Clark, N., “Heat Release and Emission Characteristics of B20 Biodiesel Fuels During Steady State and Transient Operation,” Warrendale, PA, SAE Technical Paper No. 2008-01-1377, 2008.
- **Nuszkowski, J.**, Bolyard, J., Thompson, G., and Carder, D., “In-Use Heavy-Duty Diesel Emissions Measurement Using An Air-to-Fuel Ratio Derived Exhaust Flow Rate,” Proceedings of ICEF2007 ASME Internal Combustion Engine Division 2007 Fall Technical Conference, ASME Paper No. ICEF2007-1780, Charleston, SC, 2007.
- **Nuszkowski, J.**, Thompson, G., and Clark, N., “Experimental and Error Analysis Investigation into Dilution Factor Equations,” Warrendale, PA, SAE Technical Paper No. 2007-01-0310, 2007.
- **Nuszkowski, J.**, Thompson, G., Chiamonte, M., Hu, J., and Moles, N., “Pressure Drop and Cleaning of In-Use Ash Loaded Diesel Particulate Filters,” Warrendale, PA, SAE Technical Paper No. 2006-01-3256, 2006. (Included in the book, Johnson, T.V., “Diesel Particulate Filter Technology”, SAE, Toronto, CA, 2007).

## CONFERENCE POSTERS

- **Nuszkowski, J.**, Smith, H., McKinney, M., McMahan, N., Wilder, B., Boehringer, E., Clarkson, B., Littleton, C., and Parker, K., “On-road fuel economy increase by trailing at a safe distance,” Scholars Transforming Academic Research Symposium (STARS) at the University of North Florida (UNF), April 4, 2017.
- **Nuszkowski, J.**, Timpanaro, A., and Armstrong, D., “Selective Non-Catalytic Reduction (SNCR) in a Diesel Engine,” Scholars Transforming Academic Research Symposium (STARS) at the University of North Florida (UNF), April 13, 2016.
- **Nuszkowski, J.**, “Energy Efficient Transportation,” Florida Energy Systems Consortium (FESC) Conference, Gainesville, F.L., May 12-13, 2014.

- **Nuszkowski, J.**, Olatunji, I., Clark, N., Werner, T., and McLaughlin, S., “Predicting and Utilizing the Vehicle’s Past and Future Road Grade,” Directions in Engine-Efficiency and Emissions Research Conference (Detroit, Michigan), October 2011.
- Ice, J., Ryskamp, R., Balakrishnan, R., **Nuszkowski, J.**, and Shade, B., “In-cylinder Combustion Techniques to Identify Advanced Combustion,” 21<sup>th</sup> CRC On-Road Vehicle Emissions Workshop (San Diego, California), 2011.
- Ryskamp, R., Ice, J., Balakrishnan, R., **Nuszkowski, J.**, and Shade, B., “Characterization of Fuels to Enable Advanced Combustion in a Light Duty Compression Ignition Engine Through Emissions and Performance Measurements,” 21<sup>th</sup> CRC On-Road Vehicle Emissions Workshop (San Diego, California), 2011.
- Shade, B., **Nuszkowski, J.**, Thompson, G., Wayne, S., Gautam, M., and Clark, N., “Regulated Emissions of Heavy-Duty Diesel Engines - Past, Present and Future,” Proceedings of the Better Air Quality (BAQ) 2010, Singapore, November 2010.
- **Nuszkowski, J.**, Shade, B., “The Impact of using Derived Fuel Consumption Maps to Predict Fuel Consumption,” Directions in Engine-Efficiency and Emissions Research Conference (Detroit, Michigan), September 2010.
- Shade, B., **Nuszkowski, J.**, Thompson, G., Wayne, S., Gautam, M., Clark, N., and Atkinson, C., “Regulated Emissions of Heavy-Duty Diesel Engines - Past, Present and Future,” 20<sup>th</sup> CRC On-Road Vehicle Emissions Workshop (San Diego, California), 2010.
- Carder, D., **Nuszkowski, J.**, Shade, B., Thompson, G., Clark, N., and Gautam, M., “Development and Demonstration of a Next Generation Mobile Heavy-Duty Emissions Testing Laboratory,” 20<sup>th</sup> CRC On-Road Vehicle Emissions Workshop (San Diego, California), 2010.
- Carder, D., Wu, Y., **Nuszkowski, J.**, Shade, B., Clark, N., and Gautam, M., “Development of a Transportable, 1065-Compliant Emissions Measurement System,” Directions in Engine-Efficiency and Emissions Research Conference (Dearborn, Michigan), 2009.
- Shade, B., **Nuszkowski, J.**, Thompson, G., and Clark, N., “Statistical Analysis of Transient Cycle Test Results in a 40 CFR Part 1065 Engine Dynamometer Test Cell,” Directions in Engine-Efficiency and Emissions Research Conference (Dearborn, Michigan), 2009.
- Liew, C.M., Li, H., Gatts, T., **Nuszkowski, J.**, Xu, S., Rapp, B., and Clark, N., “An Investigation of Combustion and Emissions Characteristics of Heavy-Duty Diesel

Engines Supplemented with Hydrogen,” Directions in Engine-Efficiency and Emissions Research Conference (Dearborn, Michigan), 2009.

## **FUNDED RESEARCH**

- “Design of a Formula SAE Engine Oil Pan for Reduced Weight and Center of Gravity,” ICS Innovation Fund, August 2015 – June 2016, \$10,000.
- “Design of a 3D Printed Intake Manifold for a Formula SAE Car,” APR Energy, August 2015 – June 2016, \$10,000.
- “Design of a Carbon Fiber Body for a Formula SAE Car,” APR Energy, August 2015 – June 2016, \$10,000.
- “Design of a Pneumatically Operated Sequential Gear Shifting System,” John & Suzanne Campion Family Foundation, August 2015 – June 2016, \$2,000.
- “Design and Construction of a Fluid Amplifier Cooler,” Bonar Engineering, Inc., Jacksonville, FL, June 2014 – June 2015, \$25,000.
- “Energy Efficient Vehicles,” UNF Foundation Board, Jacksonville, FL, July 1, 2013 – June 1, 2015, \$15,000.
- “Design of a Differential for a Formula SAE Car,” IAM Racing, August 2014 – June 2015, \$1,500.
- “Design of a Lightweight Pedal Box for a Formula SAE Car,” Brumos, August 2014 – June 2015, \$5,000.
- “Design of a Formula SAE Suspension and Wheel Package,” APR Energy, August 2014 – June 2015, \$10,000.
- “Design of a Formula SAE Car Body for Low Drag and High Downforce,” APR Energy, August 2013 – June 2014, \$30,000.
- “Design of a Cooling System for a Formula SAE Car,” Brumos, August 2013 – June 2014, \$5,000.
- “Small Scale Engine Performance Screening for Alternative Navy Fuels,” Principle Investigator, West Virginia University, Morgantown, WV, January 2013 – December 2013, \$6,000.
- “Assessment of “the Expander,” an Apparatus and Method for converting Thermal

- to Electrical Energy,” Henry B. Bonar II, Jacksonville, FL, November 2011 – August 2012, \$10,176.
- “Support for the Fuels to Enable Light-Duty Diesel Advanced Combustion Regimes Project,” Principle Investigator , West Virginia University, Morgantown, WV, August 2011 – March 2012, \$22,000.
  - “Fuels to Enable Light-Duty Diesel Advanced Combustion Regimes,” Principle Investigator as of 12/30/2010, Coordinating Research Council, Inc., Dec. 1, 2008 – Nov. 30, 2011, Alpharetta, GA, \$434,514.
  - “Norfolk Southern Tier 0 Emissions Evaluation,” Co-Investigator, Norfolk Southern Railway Company, Nov. 1, 2010 – July. 31, 2010, Roanoke, VA, \$166,452.
  - “Regulated Gaseous and PM Emissions of In-use Heavy-Duty Trucks,” Principle Investigator as of 12/29/2010, Caterpillar, Inc., Oct. 1, 2009 – Jun. 30, 2011, Mossville, IL, \$159,626.
  - “Norfolk Southern Tier 0 Emissions Evaluation,” Co-Investigator, Norfolk Southern Railway Company, Aug. 1, 2010 – Dec. 31, 2010, Roanoke, VA, \$131,798.
  - “Norfolk Southern Tier 0 Emissions Evaluation,” Co-Investigator, Norfolk Southern Railway Company, Mar. 1, 2010 – Dec. 31, 2010, Roanoke, VA, \$166,452.
  - “CARB Verification of Süd-Chemie / Diesel Emission Technologies PDPF,” Co-Investigator, Süd-Chemie, Inc., June 1, 2009 – Dec. 31, 2010, Needham, MA, \$83,460.
  - “TCEQ Certification of a Fuel Additive,” Co-Investigator, Afton Chemical Corporation, Dec. 1, 2009 – Dec. 31, 2010, Richmond, VA, \$98,823.
  - “Rypos Level 3 Plus TRU Verification Using the CARB Procedure,” Principle Investigator as of 12/29/2010, Rypos, Inc., Jun. 30, 2011 – Dec. 31, 2010, Holliston, MA, \$68,909.
  - “Norfolk Southern Tier 0 Emissions Evaluation,” Co-Investigator, Norfolk Southern Railway Company, Aug. 1, 2009 – Dec. 31, 2010, Roanoke, VA, \$92,747.
  - “Regulated Gaseous and PM Emissions of In-use Heavy-Duty Trucks,” Principle Investigator as of 12/29/2010, Caterpillar, Inc., Dec. 1, 2009 – Jun. 30, 2011, Mossville, IL, \$300,000.
  - “Biodiesel Fleet Emissions and Greenhouse Gas Demonstration,” Co-Investigator,

Central Florida Regional Transportation Authority (LYNX), Oct. 1, 2009 – Mar. 31, 2010, Orlando, FL, \$488,513.

- “Engine Dynamometer Research for an Air Moving Device,” Co-Investigator, Global Sus. Technologies, Oct. 1, 2009 – Dec. 31, 2009, Knoxville, TN, \$46,889.
- “Refined Fuel Additive Effects on Emissions,” Principle Investigator, Afton Chemical Corporation, Sep. 1, 2009 - June 30, 2010, Richmond, VA, \$16,466.
- “Verification of 40 CFR Part 92 Compliance Testing for Auxiliary Engines,” Principle Investigator, Emisstar, Aug. 1, 2009 – Dec. 31, 2009, New Boston, NH, \$9,282.
- “Norfolk Southern Tier 0 Emissions Evaluation,” Co-Investigator, Norfolk Southern Railway Company, Aug. 1, 2009 – Dec. 31, 2009, Roanoke, VA, \$156,722.
- “Evaluation of Production Heavy-Duty Diesel Engines for 2010 Emissions Compliance,” Co-Investigator, Mack Trucks, Inc., July 1, 2009 – Dec. 31, 2009, Hagerstown, MD, \$88,190.
- “Fuel Additive Effects on Emissions,” Co-Investigator, Afton Chemical Corporation, May 1, 2009 – Apr. 30, 2010, Richmond, VA, \$16,400.
- “Advanced Powertrain Simulation,” Principle Investigator, Mack Trucks, May 1, 2009 – Jan. 31, 2010, Hagerstown, MD, \$50,641.

#### **RESEARCH PROPOSALS NOT FUNDED (Since Fall 2011)**

- “Hands-on Activities and Research for Internal Combustion Engines,” UNF Academic Affairs - Faculty Development, Summer 2016, **\$7,500**, PI: John Nuszowski.
- “MRI: Acquisition of an X-Ray CT Scanning System for Multidisciplinary Research and Education,” National Science Foundation (NSF), 8/1/15-7/31/17, **\$440,070**, PI: Nick Hudyma, Co-PIs: Juan Aceros, Christopher Brown, John Nuszowski, and Stephen Stagon.
- “Development and Implementation of a Sustainable Energy Field Workshop, Webinar, and Video Podcasts,” Florida Energy Systems Consortium (FESC), 9/1/14-10/31/15, **\$70,000**, PI: John Nuszowski, Co-PIs: Christopher Brown and Alan Harris.
- “Development of a High Accuracy and Low Cost In-cylinder Pressure Sensing System,” DoD - Army, **\$48,765**, May 1, 2014 – June 1, 2015, PI: John Nuszowski and co-PI: Juan Aceros.

- “Precision In-cylinder Pressure Sensor for Heavy Duty Diesel Engines,” Academic Affairs – Scholarship Grant, **\$20,000**, May 15, 2014 – May 14, 2015.
- “NSF/DOE Partnership on Advanced Combustion Engines: The Influence of In-cylinder Urea Injection on NOx Production during Low Temperature Combustion (LTC),” National Science Foundation (NSF), **\$511,033**, March 1, 2013 – February 28, 2015, PI: John Nuszowski, co-PI: Daniel Carder (WVU)
- “UTC Natural Gas Fueled Transportation,” West Virginia University (WVU) through proposal to FDOT, **\$252,004**, July 1, 2013 – September 30, 2017, PI: John Nuszowski
- “SBIR Phase I: Smart Injector Utilizing Fiber Optics,” L&J Diesel Services, **\$50,000**, July 1 2012 – December 2012, PI: John Nuszowski

#### **DEPARTMENT, COLLEGE, UNIVERSITY SERVICE**

- Faculty Advisor for the Formula Society of Automotive Engineering (FSAE) Club, Fall 2011 – Present.
- ME Instructor/Advisor Search Committee, Department Service, UNF, Fall 2015 – Spring 2016.
- Engineering Scholarship Committee, Department Service, UNF, Fall 2013 - Spring 2016.
- Food Services Committee, University Service, UNF, Fall 2014 - Spring 2016.
- SoE Guidelines Committee, Department Service, UNF, Spring 2014.
- Graduate Program Review Committee, Department Service, UNF, Fall 2013 - Spring 2014.
- ME Search Committee, Department Service, UNF, Fall 2013 - Spring 2014.
- Design Report Committee, Department Service, UNF, Spring 2013.
- Outstanding Undergraduate Teaching Award Committee (Chair), College Service, UNF, Spring 2013.
- Outstanding Graduate Teaching Award Committee, College Service, UNF, Spring 2013.
- Critical Thinking Committee Member, Department Service, UNF, Fall 2011 – Spring



2013.

- Outstanding Undergraduate Teaching Award Committee, College Service, UNF, Spring 2012.
- Critical Thinking Committee Member, Department Service, UNF, Fall 2011 – Spring 2012.
- Faculty Retention Committee Member, University Service, WVU, Spring – Fall 2010.

#### **ENGINEERING INSTITUTION MEMBERSHIPS**

American Society Of Mechanical Engineers (ASME), Journal and Conference Paper Reviewer

Society of Automotive Engineers (SAE), Journal and Conference Paper Reviewer