

Matthew P. Simones

Department of Automotive and Manufacturing Engineering Technology
Minnesota State University, Mankato
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(507) 389-1360

Experience

August 2018 – Present	Minnesota State University, Mankato	Mankato, MN
Assistant Professor Courses Taught: <ul style="list-style-type: none">▪ AET 261 Automotive Driveability and Diagnosis (4 cr)▪ AET 280 Data Acquisition and Analysis (3 cr)▪ AET 366 Automotive Thermodynamics and Engine Design (3 cr)▪ AET 492/592 Seminar: Programmable Data Acquisition (LABVIEW) (3 cr)▪ MET 323: Statics (3cr)		
August 2016 – August 2018	Nortek Air Solutions	Shakopee, MN
Senior Analytical Engineer <ul style="list-style-type: none">▪ Responsible for all technical information leaving the thermodynamic test facility to either internal or external customers including sign off on test data accuracy, validity, and compliance with applicable standards▪ Review test requests for feasibility and ability to meet customer requirements.▪ Design and oversee tests and testing requirements▪ Conduct detailed mathematical modeling and data analysis as required▪ Review performance predictions of custom system configurations▪ Plan and execute laboratory maintenance and calibration plans▪ Mentor and assist engineers and technicians▪ Actively participate in AHRI 410 standard review committee▪ Work with lab manager to develop short term and long term plans for laboratory infrastructure		
January 2017 – December 2017	Minnesota State University, Mankato	Mankato, MN
Adjunct Faculty <ul style="list-style-type: none">▪ AET 366 Automotive Thermodynamics and Engine Design (3 cr), Spring 2017▪ ME 691 Advanced Mechanical Engineering Experimentation (3 cr), Fall 2017		
November 2015 – August 2016	Nortek Air Solutions	Eden Prairie, MN
Senior Thermal Engineer <ul style="list-style-type: none">▪ Performed thermal system design of custom engineered HVAC equipment including DX, chilled water, and energy recovery systems▪ Developed and reviewed thermal analysis tools for both development and application engineers▪ Developed mathematical model for counter-flow evaporative condensers. Used model to determine heat and mass transfer coefficients from test data, and created correlations using dimensionless parameters. Assisted in incorporating model into application tools.▪ Participated in internal and external standard review committees. Introduced method for estimating tolerances in performance predictions.		
June 2014 – November 2015	Nortek Air Solutions	Shakopee, MN
Test Lab Engineer II <ul style="list-style-type: none">▪ Responsible for conducting a wide variety of thermodynamic tests in conjunction with development and application engineers. Executed testing plan including building test setup, performing measurements, troubleshooting, data analysis, tear down, and report of findings▪ Designed test fixtures including duct work, mechanical structures, controls, and measurement devices▪ Performed thermodynamic, psychrometric, and measurement uncertainty calculations. Ensured all tests, measurements, and calculations were conducted in accordance with ANSI, ASHRAE, ISO, and AHRI standards▪ Gained familiarity in setup, calibration and use of various sensor technologies including thermocouples, RTDs, pressure transducers, electrical power analyzers (single and three phase), flowmeters, psychrometers, RH sensors▪ Performed maintenance of laboratory equipment and facility in conjunction with lab technician(s) and other lab engineer(s)		

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Jan. 2010 – June 2014	Nuclear Science and Engineering Institute	Columbia, MO
Postdoctoral Fellow Research Assistant (Jan. 2010 – Dec. 2013) <ul style="list-style-type: none">Conducted experimental research in multiple areas including aerosol particle characterization and measurement from spark generated and nebulized sources, aerosol particle collection using electrostatic precipitation and low pressure inertial impaction, and measurement of viscosity and the velocity slip coefficient for binary gas mixturesDeveloped models and performed numerical simulations of fission product gas release from porous nuclear fuelWorked with external companies on collaborative research projects involving aerosol measurement and characterizationGained experience with TSI aerosol instruments (3936, 3071A, 3080, 3775, 3776, 3076), PALAS aerosol generators (GFG-1000, DNP-3000), MKS SRG-2 spinning rotor gauge, high vacuum systems, scanning probe microscopy, electron microscopy (TEM, SEM), parallel computing		
July 2012 – Aug. 2012	Becker-Technologies GmbH	Eschborn, Germany
Visiting Engineer <ul style="list-style-type: none">Provided expertise in measuring aerosol size distributions using scanning mobility particle sizer (GRIMM SMPS+C)Designed aerosol sampling device for pressure vessel with air-steam environmentWorked with engineers and shop personnel to build and implement aerosol sampling designWorked with engineers to develop experimental procedure to meet test specifications		
Apr. 2007 – Jan. 2010	Minnesota State University, Mankato	Mankato, MN
Research Assistant / Teaching Assistant <ul style="list-style-type: none">Developed computer programs in MATLAB for solving various mathematical models of explosive and rapid decompression of aircraft and performed numerical simulations for various initial conditionsProvided experimental assistance/support for simulated bridge cracking and corrosion investigationProvided experimental assistance/support for unglazed transpired solar collector (SolarWall) investigationTeaching assistant for heat transfer and fluid mechanics courses and labs (ME 299, ME 321, ME 324, ME 466)		
Dec. 2005 – Aug. 2006 Apr. 2000 – Apr. 2003	Klingelhutz Construction	Chaska, MN
Diesel Technician/Equipment Operator/Laborer <ul style="list-style-type: none">Performed maintenance and repair on heavy equipment, medium and heavy duty trucks, and light duty vehiclesOperated tractor-scraper (Caterpillar Challenger)Assisted operations in pre-fabricated wall shop and on construction sites		
May 2005 – Aug. 2005	Le Sueur Inc.	Le Sueur, MN
Quality Inspector <ul style="list-style-type: none">Performed quality inspection and helium leak testing on cast aluminum Thermo King 2 & 4 cyl. compressor bodies		
Apr. 2003 – Aug. 2004	Ziegler Caterpillar	Bloomington, MN
Diesel Technician <ul style="list-style-type: none">Performed complete out-of-frame overhauls on 3200, 3300, 3400 & 3500 series diesel enginesPerformed engine test and break-in procedure on Taylor dynamometerPerformed maintenance, troubleshooting, and repair of heavy equipmentCompleted Caterpillar Basics, Caterpillar Basic Engine, and forklift safety training		

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Education

Jan. 2010 – Dec. 2013 University of Missouri - Columbia Columbia, MO

Ph.D., Nuclear Engineering, 4.0 GPA

- Thesis: Measurement of Coagulating Silver and Carbon Aerosols Using a Tandem Differential Mobility Analyzer (Advisors: S. K. Loyalka, M. A. Prelas, T. K. Ghosh, R. V. Tompson, D. S. Viswanath)
- GAANN Fellowship 2010 – 2013
- Related Courses: Intro. to Nuclear Reactor Engineering, Nuclear Reactor Theory I & II, Nuclear Thermal Hydraulics and Safety, Nuclear Reactor Laboratory, Advanced Heat & Momentum Transport, Advanced Mass Transfer, Advanced Chemical Engineering Thermodynamics, Interactions of Radiation with Matter, Nuclear Radiation Detection, and Aerosol Science and Engineering

Sept. 2009 – July 2011 Minnesota State University, Mankato Mankato, MN

MS, Mechanical Engineering, 3.88 GPA

- Thesis: Application of the TDMA Technique Toward the Size and Charge Distribution Measurement of Graphite, Gold, Palladium, and Silver Aerosols (Advisors: P. A. Tebbe, S. K. Loyalka, S. Moaveni)
- Related Courses: Thermal/Fluid System Design, Advanced Computational Methods in Engineering, Intermediate Fluid Mechanics, Computer Aided Engineering, Classical Mechanics

June 2005 – May 2009 Minnesota State University, Mankato Mankato, MN

BS, Mechanical Engineering, 3.54 GPA

- Outstanding Student Award – Mechanical Engineering Dept., April 2009
- V-Tek, Inc. Engineering Scholarship (2007-2008)
- Minor in Physics
- Registered Engineer-In-Training in the state of Minnesota (obtained August 2009)
- Related Courses: Thermodynamics, Applied Thermodynamics, Heat Transfer, Fluid Mechanics, Mechanics of Materials, Engineering Analysis, Geometric Dimensioning & Tolerancing (GD&T), Design of Machine Elements, Manufacturing Processes, Material Science, Computer Aided Engineering (Pro/E), Mechanical Engineering Experimentation I-III, Modern Physics I-II, Statistical Physics, Quantum Mechanics, Optics

Sept. 2002 – May 2004 Hennepin Technical College Brooklyn Park, MN

AAS, Medium and Heavy Truck Technology

- Relevant Courses: Truck Technology Fundamentals, Vehicle Service, Electricity in Truck Technology I-II, Intro. to Diesel Engines, Diesel Engine I-IV, HVAC, Clutch & Driveline, Transmission Technologies, Drive Axles, Hydraulic Brake Systems, Air Brake Systems and Controls, Steering & Suspension Systems, Internship I-V

Publications

Simones, M. P., Loyalka, S. K. (2015). Measurements of Charged Aerosol Coagulation. *Nuclear Technology*, 189(1), 45-62.

Simones, M. P., Loyalka, S. K., Power, P., Duffy, C., MacLoughlin, R., Tatham, A. (2014). Measurement of the Size and Charge Distribution of Sodium Chloride Particles Generated by an Aeroneb Pro® Pharmaceutical Nebulizer. *European Journal of Nanomedicine*, DOI:10.1515/ejnm-2013-0018.

Simones, M. P., Reinig, M. L., & Loyalka, S. K. (2014). A Mathematical Model for the Release of Noble Gas and Cs from Porous Nuclear Fuel Based on VEGA 1&2 Experiments. *Journal of Nuclear Materials*, DOI:10.1016/j.jnucmat.2014.01.050.

Simones, M. P., Gutti, V. R., Meyer, R. M., & Loyalka, S. K. (2011). Measurements of Aerosol Charge and Size Distributions for Graphite, Gold, Palladium, and Silver Nanoparticles. *Nuclear Technology*, 176(2), 211-226.

Saeed, M., Tebbe, P. A., Schwartzkopf, L., Dobmeier, J., Gehrke, J., & Simones, M. (2011). The Magnitude of the Thermal Energy Stored in a Building Wall Adjacent to an Unglazed Transpired Solar Collector. *ASME Conf. Proc.* 2011, 29-34.

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Saeed, M., Tebbe, P. A., Schwartzkopf, L., Dobmeier, J., Gehrke, J., & Simones, M. (2011). A Numerical Model for Thermal Performance of an Unglazed Transpired Solar Collector. ASME Conf. Proc. 2011, 291-296.

Tebbe, P. A., Saeed, M., Schwartzkopf, L., Dobmeier, J., Gehrke, J., & Simones, M. (2011). Study of Unglazed Transpired Solar Collector Installations in the Twin Cities Minnesota Climate. ASHRAE Transactions, 117(1), 579-586.

Daidzic, N. E., & Simones, M. P. (2010). Aircraft Decompression with Installed Cockpit Security Door. Journal of Aircraft, 47(2), 491-504.

Professional Memberships and Committees

- Society of Automotive Engineers (SAE), Engine Builders Association (AERA)
- SAE Cooling System Standards Committee Member

Thesis Committee Member

- Jon Richter (2019), *Flow Fields Past Grain Bins as it Relates to Vertical Axis Wind Turbine Placement Optimization*, MS-ME
- David Bassey (2019), *Employing 2-D CFD & LRB Model Around Trees to Improve VAWT Placement*, MS-ME
- Nhat Le (2020), *Interfacial Behavior of Constant System during Liquid Mediated Rough Surfaces Separation*, MS-ME
- John Ruprecht (2020), *Binder Saturation, Layer Thickness, Drying Time and Their Effects on Dimensional Tolerance and Density of Cobalt Chrome-Tricalcium Phosphate Biocomposite*, MS-MET

Professional Development and Certifications

- AERA Certified Engine and Cylinder Head Machinist (2019)
- Basics of Internal Combustion Engines (SAE, 2019)
- Introduction to Commercial & Off-Road Vehicle Cooling Airflow Systems (SAE, 2019)
- LabVIEW CORE 1, CORE 2, Data Acquisition Using NI-DAQmx and LabVIEW
- Various ATG seminars (Cummins Diesel, Hybrid Electric, Intermittent Electrical Diagnosis, GM Systems)

Additional Skills

- Excel VBA, Python, LabVIEW, Mathematica, MATLAB
- Hands-on experience with troubleshooting and repair of mechanical, electrical, hydraulic, and pneumatic systems