

# Phillip Deierling

## Curriculum Vitae

*"Scientist Dream About Doing Great Things. Engineers Do Them." - James A. Michener*

### Education

- 2016 **Ph.D. Mechanical Engineering**, *The University of Iowa*, Iowa City, IA.
- 2010 **M.S. Mechanical Engineering**, *The University of Iowa*, Iowa City, IA.
- 2009 **B.S. Mechanical Engineering**, *The University of Iowa*, Iowa City, IA.

### Awards and Honors

- 2017 National Research Council Post-Doctoral Fellowship
- 2017 Best Paper, 1st place, AIAA SciTech American Society of Composites Aerospace Design and Structures Student Paper Competition
- 2016 Best Paper, 1st place, AIAA SciTech Lockheed-Martin Aerospace Design and Structures Student Paper Competition
- 2014 Best Paper, 3rd place, Jakobsen Memorial Conference, The University of Iowa
- 2014 Student Senate Travel Funds Award, The University of Iowa
- 2009 Team Achievement Award, NASA GEMS Mission
- 2006 National Science Foundation Scholarship
- 2003 State of Iowa Ultimate Gas Mileage Competition, 2nd Place

### Professional Experience

- July 2018–Present **Lecturer**, *The University of Iowa*, Department of Mechanical Engineering, Iowa City, IA.
- Jan.–July 2018 **Lecturer**, *The University of Iowa*, Department of Mechanical and Industrial Engineering, Iowa City, IA.
- 2017–2018 **Postdoctoral Research Associate**, *National Research Council, AFRL Munitions Directorate*, Eglin AFB, FL.
- 2013–2016 **Graduate Research Assistant**, *The University of Iowa*, Center for Computer Aided Design (CCAD), Iowa City, IA.

- May–Aug. 2016 **Contract Research Associate**, *United States Air Force Scholars Program*, Eglin AFB, FL.
- Feb.–May 2016 **Visiting Research Associate**, *University of Florida*, Department of Industrial and Systems Engineering, Shalimar, FL.
- May–Aug. 2015 **Contract Research Associate**, *United States Air Force Scholars Program*, Eglin AFB, FL.
- Aug.–Nov. 2014 **Contract Research Associate**, *United States Air Force Scholars Program*, Eglin AFB, FL.
- May–Aug. 2014 **Research Assistant**, *United States Air Force Summer Faculty Fellowship Program*, Eglin AFB, FL.
- May–Aug. 2013 **Research Assistant**, *United States Air Force Summer Faculty Fellowship Program*, Eglin AFB, FL.
- 2011–2013 **Platform Engineer, Steer Axles**, *DANA Holding Corporation*, Maumee, OH.
- 2008–2010 **Graduate Research Assistant**, *The University of Iowa*, Center for Computer Aided Design (CCAD), Iowa City, IA.
- May–Aug. 2008 **Undergraduate Research Assistant**, *The University of Iowa*, Center for Computer Aided Design, Iowa City, IA.

## Teaching and Mentoring

- May–Aug. 2017 **Mentor**, *AFRL Mathematical Modeling and Optimization Institute*, Eglin AFB, FL. Thermal degradation of polymer matrix composites at elevated temperatures.
- 2013–2014 **Tutor**, *The University of Iowa*, Gerdin Athletic Learning Center, Iowa City, IA.
- Aug.–Dec. 2013 **Teaching Assistant**, *The University of Iowa*, *College of Engineering*, Mechanical Systems Design, Iowa City, IA.
- Aug.–Dec. 2009 **Teaching Assistant**, *The University of Iowa*, *College of Engineering*, Mechanical Systems, Iowa City, IA.
- Jan.–May 2013 **Teaching Assistant**, *The University of Iowa*, *College of Engineering*, Mechanical Systems, Iowa City, IA.
- 2007–2010 **Lead Tutor**, *The University of Iowa*, *College of Engineering*, Iowa City, IA.

## Journal Publications

Phillip E Deierling and Olesya I Zhupanska. “Computational modeling of the effective properties of spatially graded composites”. In: *International Journal of Mechanical Sciences* 145 (2018), pp. 145–157.

Phillip E Deierling, Olesya I Zhupanska, and Crystal L Pasiliao. “Thermomechanical Response of a Spatially Graded Metal-Ceramic Composite Structural Panel Subjected to High-Speed Loads”. In: *Journal of Aerospace Engineering* (2018, IN-PRESS).

Phillip E Deierling and Olesya I Zhupanska. “Experimental study of high electric current effects in carbon/epoxy composites”. In: *Composites Science and Technology* 71.14 (2011), pp. 1659–1664.

Phillip E Deierling. "Optimization of a Spatially Graded Composite Monoque Airframe in High-Speed Flow". In: *TBD (IN PREPARATION)*.

Phillip E Deierling, Olesya I Zhupanska, and Crystal L Pasilio. "Optimization of a Metal-Ceramic Spatially Graded Composite Panel in High-Speed Flow". In: *Journal of Aerospace Engineering (IN REVIEW)*.

## Conference Proceedings

Phillip E Deierling, Olesya I Zhupanska, and Emily R Dreyer. "Optimization of Spatially Tailored Metal-Ceramic Composite Airframe in a High-Speed Environment". In: *To be presented at: ASME International Mechanical Engineering Congress & Exposition*. (2018).

Phillip E Deierling, Olesya I Zhupanska, and Crystal L Pasilio. "Micromechanical Modeling of Ti/TiB Composites: Effects of TiB Whisker Orientational Distribution on the Overall Properties". In: *59th AIAA/ASCE/AHS/ASC Structures, Structural Dynamics, and Materials Conference*. (2018).

Phillip E Deierling, Olesya I Zhupanska, and Crystal L Pasilio. "Investigation of the Effects of Porosity on the Overall Thermomechanical Properties of Graded Metal-Ceramic Composites". In: *58th AIAA/ASCE/AHS/ASC Structures, Structural Dynamics, and Materials Conference*. 2017, p. 0124.

Phillip E Deierling, Olesya I Zhupanska, and Crystal L Pasilio. "Thermal Response of a Spatially Graded Metal-Ceramic Structural Panel to Non-Uniform Heating in Hypersonic Flow". In: *57th AIAA/ASCE/AHS/ASC Structures, Structural Dynamics, and Materials Conference*. 2016, p. 0490.

Phillip E Deierling, Olesya I Zhupanska, and Crystal L Pasilio. "Effects of Variable Phase Volume Fractions on the Effective Thermal-Mechanical Properties of Metal-Ceramic Composites with Graded Microstructures". In: *ASME International Mechanical Engineering Congress & Exposition*. 2015.

Phillip E Deierling, Olesya I Zhupanska, and Crystal L Pasilio. "Micromechanical modeling of metal-ceramic composites for high temperature applications". In: *56th AIAA/ASCE/AHS/ASC Structures, Structural Dynamics, and Materials Conference*. 2015, p. 0129.

Phillip E Deierling, Olesya I Zhupanska, and Crystal L Pasilio. "Thermo-mechanical behavior of spatially tailored functionally graded materials in a high temperature environment". In: *American Society of Composites-30th Technical Conference*. 2015.

Phillip E Deierling and Olesya I Zhupanska. "Experimental study of high electric current effects in carbon fiber polymer matrix composites". In: *52nd AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics and Materials Conference 19th AIAA/ASME/AHS Adaptive Structures Conference 13t*. 2011, p. 2113.

## Conference Presentations

Phillip E Deierling and Olesya I Zhupanska. "Thermomechanical Performance of Spatially Tailored Metal-Ceramic Composites in a High-Temperature Environment". ASME International Mechanical Engineering Congress & Exposition, Tampa, FL. 2018.

Phillip E Deierling. "Micromechanical Modeling of Ti/TiB Composites: Effects of TiB Whisker Orientation and Distribution on the Overall Properties". 5th Annual Meeting of the Air Force Research Laboratory Mathematical Modeling and Optimization Institute, Eglin AFB, FL. 2017.

Phillip E Deierling. "Effective Elastic, Thermal and Thermoelastic Properties of Metal-Ceramic Composites with Spatially Tailored Microstructures". 4th Annual Meeting of the Air Force Research Laboratory Mathematical Modeling and Optimization Institute, Eglin AFB, FL. 2016.

Phillip E Deierling. "Thermo-Mechanical Response of Metal-Ceramic Composites for High-Temperature Applications: Response of a spatially tailored Ti/TiB<sub>2</sub> panel subject to hypersonic flow". 3rd Annual Meeting of the Air Force Research Laboratory Mathematical Modeling and Optimization Institute, Eglin AFB, FL. 2015.

Phillip E Deierling. "Modeling of the effective thermo-mechanical properties of Aluminum/Zirconia composite over a wide-temperature range". 2nd Annual Meeting of the Air Force Research Laboratory Mathematical Modeling and Optimization Institute, Eglin AFB, FL. 2014.

Phillip E Deierling. "Thermomechanical Response of Functionally Graded Materials for Extreme Environments". 12th Annual College of Engineering Research Open House, The University of Iowa, Iowa City, IA. 2014.

Phillip E Deierling and Olesya I Zhupanska. "Thermomechanical Behavior of Spatially Tailored Functionally Graded Materials in a High-Temperature Environment". ASME International Mechanical Engineering Congress & Exposition, Montreal, CA. 2014.

Phillip E Deierling. "Thermomechanical Response of Functionally Graded Composite Plates". 1st Annual Meeting of the Air Force Research Laboratory Mathematical Modeling and Optimization Institute, Eglin AFB, FL. 2013.

Phillip E Deierling, Marcus Viggiani, and Olesya I Zhupanska. "Development of a New Experimental Setup for Electrical and Impact Characterization of Composites Subjected to Time-Varying Loads". 8th Annual College of Engineering Research Open House, The University of Iowa, Iowa City, IA. 2010.

## Invited Lectures and Presentations

Phillip E Deierling. *Product Liability in Engineering Design*. The University of Iowa, College of Engineering, Mechanical Systems/Mechanical Systems Design, Iowa City, IA. 2013–Present.

Phillip E Deierling. *From Academia to Industry*. The University of Iowa, College of Engineering, Undergraduate Professional Seminar, Iowa City, IA. 2011.

## Patents

Phillip E Deierling and Stoyan I Stoychev. "Vehicle knuckle with bolt-on steer arm". Pat. US Patent 8,857,833. 2014.

Phillip E Deierling, Mark A Davis, and Jeffrey A Dutkiewicz. "Tie rod tube assembly and method of forming by magnetic pulse welding". Pat. US Patent App. 14/074,141. 2013.

## Training and Certifications

2018 **Kuka Robotics Operator Training and Certification**, *Shelby Township, MI*.

2018 **Kuka Robotics Programming 1 Training and Certification**, *Shelby Township, MI*.

2015 **Collaborative Institutional Training Initiative (CITI) training**, *Iowa City, IA*.

2012 **Obtaining a Converged Solution with Abaqus**, *West Lafayette, IN*.

1630 Morningside Drive – Iowa City, IA 52245

☎ (319) 850-0064 • ✉ [phillip.deierling@gmail.com](mailto:phillip.deierling@gmail.com)

- 2011 **ITAR: Export Compliance Training**, *Maumee, OH.*
- 2011 **Shainin Red X: Strategies for Problem Solving**, *Henderson, KY.*
- 2011 **Advanced Modeling using Pro/ENGINEER WF4.0, Master Level**, *Maumee, OH.*
- 2011 **State of Iowa Engineering in Training Certificate.**

## Membership in Professional Societies

- AIAA **American Institute of Aeronautics and Astronautics**, *Education Subcommittee, STEM K-12 Subcommittee, Fluid-Structure Interaction Discussion Group*, Member since, 2013.
- ASME **American Society of Mechanical Engineers**, *Structures and Materials Technical Committee*, Member since, 2013.
- ASC **American Society of Composites**, Member since, 2013.
- SAE **Society of Automotive Engineers**, Member since, 2013.

## Computer and Programming Skills

- RPA **Robotic Process Automation**, *Kuka.Sim Pro, Kuka Robot Language (KRL).*
- CAD **Computer Aided Design**, *CREO (formerly Pro/ENGINEER), SolidWorks, Catia.*
- FEM/FEA **Finite Element Modeling/Analysis**, *ABAQUS, Calculix, ANSYS, HyperWorks.*
- CFD **Computational Fluid Dynamics**, *ABAQUS, ANSYS, OpenFOAM, FUN3D.*
- MBD **Multibody Dynamics**, *LMS Virtual Lab, Adams.*
- MISC **Miscellaneous**, *COMSOL, PSpice, Minitab, Portable Batch Scripting (PBS).*
- CPL **Computer Programming Languages**, *FORTRAN, C/C++, Python, MATLAB.*
- HPC **High-Performance Computing**, *OpenMP, MPI, OpenACC.*
- OS **Operating systems**, *Windows, Linux (Debian and RPM based).*

## Technical Skills

- Robotics **Safe and effective operation of robotics (Kuka certified)**, *proficient in robot programming and path planning (Kuka certified), maintenance and trouble shooting of robotic systems.*
- Mechatronics **Design and fabrication of mechatronic equipment, automated systems and Internet of Things (IoT) devices..**
  - Electronics: resistors, transistors, capacitors, diodes, etc
  - Mechanical: gears, pulleys, fastening methods, etc.
  - Microcontrollers: Raspberry Pi and Arduino.
  - I/O: temperature, pressure, acceleration, DC, stepper and servo motors, valves.
- Manufacturing **Casting and forging, 3D printing, injection molding, etc..**
- Machining **CNC/Manual mill and lathe operator (Hass certification planned).**
- Fabrication **Slip-rolls, brake, english wheel, plasma cutter, etc..**

Welding **MIG, TIG, SMAW, Oxy-fuel.**

---

## Community Involvement

2013-Present **Volunteer Iowa City Downtown District**, *Northside Oktoberfest, Holiday Market, Taste of Iowa City, Resident Engineer*, Iowa City, IA.

2009-Present **Volunteer Clark Elementary School**, *STEAM Outreach and Education*, New London, IA.