



# The 14<sup>th</sup> Annual Dayton Engineering Sciences Symposium October 30<sup>th</sup> 2018



# WELCOME

Dear 2018 DESS Attendees,

Welcome! We, the Organizing Committee, are excited to deliver the 14th Annual Dayton Engineering Sciences Symposium (DESS) program. Sponsored by the Dayton Section of the American Society of Mechanical Engineers (ASME) and the ASME Students Section at Wright State University, this symposium is expected to facilitate professional development and communication between local, scientists, engineers, educators, and students by providing a forum for presenting their work, sharpening their technical presentation skills, and creating outstanding opportunities for networking.

Four activities highlight this year's program: a track dedicated to the theme, a keynote presentation by Dean Still, a STEAM+ track, and several theme related project demos. Dean's work on cook stove design as the Executive Director at Aprovecho focuses on emissions reductions and efficiency improvements. Achieving this goal spans many traditional fields in the thermal fluid sciences in addition to spaces atypical to traditional engineering education. Marketing and cultural nuances are just as essential to impact one of the most significant human health crises, indoor air pollution from biomass combustion. A Humanitarian Engineering track and demonstration session correspondingly highlights the year's theme with participation from many local and international institutions.

Lastly, we are proud to offer a K16 STEAM+ educator workshop. This workshop brings together many innovative and bleeding edge teaching pedagogies to stipulate collaborations and transformation in the classroom. This track has been broadened in scope such that any educator could benefit from participation.

We hope that this symposium serves the Dayton Region's professional and academic community's needs regarding technology exchange, networking, and professional development opportunities. Its success would not have been possible without the active participation of speakers, session chairs, sponsors, students, faculty, government and industry representatives, the organizing committee, and the ASME Dayton Section Executive Board. We thank you for your participation and contributions, and we sincerely hope that you enjoy DESS!

**Joshua Heyne**  
General Chair

**Tim Reissman**  
Vice-Chair

## DESS Committee

**General Chair** - Joshua Heyne

**Vice-Chair** - Tim Reissman

**Registration/Website** - Tim Leger

**WSU Student Reps/Facilities/Food** – Nick Wagner, Justin Warner

**Overall/Detailed Technical Program-**

Darren Holland, Tim Erdmann, Joshua Heyne

**K-12 Outreach** – Kevin Hallinan, Matt Szozda

**Student Section Relations** - Darren Holland,  
Joshua Heyne

**Sponsorship** - Tim Erdmann

**Scribe** - Rob Stachler

**Theme Track** - Erin Peiffer

**Communications** - Megan Reissman

**Session Chair Organizer** - Joshua Heyne

**Gifts** – Tim Erdmann, Tim Leger

**Logo Design** - Jeremy Carson

**Government Approval** - Brent Rankin,  
Ginger Ross

**Treasurer** - Vince Miller

**Chair, ASME Executive Board** –  
Joseph Miller



Room	Endeavour 156A	Endeavour 156B	Endeavour 156C	Discovery 163A	Discovery 163B	Atlantis 157A	Atlantis 157B
Time	8:30AM	8:30AM	8:30AM	8:30AM	8:30AM	8:30AM	8:30AM
	<p><b>SESSION 1</b> <b>Structures &amp; Solid Mechanics</b> Chair: Dr. Anthony Palazzotto - AFIT</p> <p>DESS2018-003 Finite Element Evaluation of Nonlinear Damping Properties for Thermal Barrier Coatings</p> <p><i>Lt Col Armando Daleon - AFRL</i> <i>Dr. Anthony N. Palazzotto - AFIT</i></p>	<p><b>SESSION 2</b> <b>Humanitarian Engineering I</b> Chair: Dr. Kellie Schneider - UD</p> <p>* DESS2018-026 * Design, Construction, and Installation of Hand-Operated PVC Water Pumps for Rural Communities</p> <p><i>Jared Klimek - CDU</i> <i>Dr. Fred Harmon - CDU</i></p>	<p><b>SESSION 3</b> <b>Biomedical I</b> Chair: Dr. Kimberly Bigelow - UD</p> <p>DESS2018-071 Use of Posturography to Distinguish Fall History in Recurrent and Non-recurrent Fallers</p> <p><i>Kyra Twoly - UD</i> <i>Vinayak Vijayan - UD</i> <i>Dr. Kimberly Bigelow - UD</i></p>	<p><b>SESSION 4</b> <b>Fluid Dynamics &amp; CFD I</b> Chair: Dr. Michael List - AFRL</p> <p>DESS2018-006 Comparison of tube flow measurements using PIV and optical flow method based on dye-injected contrast</p> <p><i>Mark Johnson - WSU</i> <i>Dr. Zijeng Yang - WSU</i></p>	<p><b>SESSION 5</b> <b>Materials I</b> Chair: Dr. Hong Huang - WSU</p> <p>DESS2018-085 Identification of Nonlinear Constitutive Properties of Dampening Coatings</p> <p><i>Mackenzie Tidball - WSU</i> <i>Dr. Joseph C. Slater - WSU</i></p>	<p><b>SESSION 6</b> <b>STEAM+ Track I</b> Chairs: Dr. Kevin Hallinan; Matt Szodza - UD</p> <p>8:15AM - 8:45AM <b>Purpose-Driven Thinking and Creating Sprints</b> (5-10 mins each). Sprints organized by presenting teachers to engage as many of the attending educators, scientists, and engineers.</p>	<p><b>SESSION 7</b> <b>Practice Room</b></p>
	<p>DESS2018-022 Effects of Material Nonlinearity on the Instability of Axially Loaded Cylindrical Shells</p> <p><i>Ruben Adorno - AFIT</i> <i>Dr. Anthony N. Palazzotto - AFIT</i></p>	<p>DESS2018-008 Harvesting Thermal Energy and Applying Electricity Using Thermoelectric Generators</p> <p><i>Neeti Prasad - DRSS</i></p>	<p>DESS2018-053 Remote Monitoring of Cane Gait Cycles</p> <p><i>Sydney Lindell - UD</i> <i>Dr. Timothy Reissman - UD</i> <i>Dr. Megan Reissman - UD</i> <i>Sean Jacobs - UD</i></p>	<p>* DESS2018-030 * Injector Dynamics and Atomization Behaviors of Liquid Monopropellants in Pintle Injectors</p> <p><i>Jacob Gernerstfelder - UC</i> <i>Dr. Prashant Khare - UC</i></p>	<p>DESS2018-025 Fabricating Highly Conductive Lithium Ion Electrolyte Lithium Aluminum Titanate phosphate (LATP) for Solid-state Li-based Batteries</p> <p><i>Anurag Yaddanapudi - WSU</i> <i>J. Yang - WSU</i> <i>Dr. H. Huang - WSU</i></p>	<p>9:10AM - 9:10AM <b>Matt Szodza, Art Teacher, Centerville Schools</b> "Teaching a Process for Culture Change," will be discussing his approach to education that helps develop purpose-driven students, with stories of the impact on students.</p>	
	<p>DESS2018-029 Abstract: Optimization of the Bending Strength of a Hybrid Composite</p> <p><i>John Brewer - AFIT</i> <i>Dr. Anthony Palazzotto - AFIT</i> <i>Michael Falugi - AFRL</i></p>	<p>DESS2018-013 Design of a Commercially Viable, Improved Shea Nut Roaster for Women in Northern Ghana</p> <p><i>Erin Peiffer - UD</i> <i>Carol Brown - BUR</i> <i>Servaa Boamah - BUR</i></p>	<p>* DESS2018-091 * Prediction of Biofilm Growth on Medical Devices</p> <p><i>Taylor Pooler - WSU</i> <i>Dr. Tarun Goswami - WSU</i></p>	<p>DESS2018-073 Pulsed Active Flow Control in a Low Pressure Turbine</p> <p><i>Molly Donovan - WSU</i> <i>Dr. Mitch Wolff - WSU</i> <i>Christopher R. Marks - AFRL</i> <i>Rolf Sondergaard - AFRL</i></p>	<p>DESS2018-052 Investigating the Tensile Properties of 3D printed ABS and Carbon Fiber Reinforced ABS Polymer Composite</p> <p><i>Zhi Ge - MU</i> <i>Muhammad P. Jahan - MU</i> <i>Mert Bal - MU</i> <i>Francis Tomer - MU</i> <i>Larry Gardner - MU</i></p>	<p>9:10AM - 9:30AM <b>Tracy Martz, Science Teacher, Dayton Early Academy High School</b> "Active Learning Experiences Impacting the Lives of Diverse and Socioeconomically Disadvantaged Students in Dayton."</p>	
	<p>DESS2018-047 A Tensgrity Approach to Aircraft Wing Structures</p> <p><i>Austin Mills - UD</i> <i>Dr. David Myska - UD</i> <i>Dr. James Loo - AFRL</i></p>	<p>DESS2018-021 Fighting Hunger in Dayton Through Operations Research</p> <p><i>Madeline Mock - UD</i> <i>Dr. Kellie Schneider - UD</i></p>	<p>DESS2018-028 Balance Assessment in Virtual Reality Environments</p> <p><i>Diana Harbach - UD</i> <i>Tessa Hill, Sydney Lundell - UD</i> <i>Luke Schepers, Leah O'Shea - UD</i> <i>Dr. Megan Reissman - UD</i></p>	<p>DESS2018-018 Passive Flow Controls for a Cavity in the Trisonic Gasdynamic Facility</p> <p><i>Grant Johnson - AFIT</i> <i>Mark Reeder - AFIT</i> <i>Ian Maatz - AFRL</i></p>	<p>9:30AM - 9:50AM <b>Linda Hallinan, Maker and Computer Science Teacher, Miami Valley School</b> "Human-Centered Applied Creativity through Making and Computer Science," Linda will be discussing why makerspaces is so important now as well as some actual classroom examples of maker creativity and how she measures creativity in her classroom.</p>		
9:50AM	Break						





Room	Endeavour 156A	Endeavour 156B	Endeavour 156C	Discovery 163A	Discovery 163B	Atlantis 157A	Atlantis 157B
Time	10:05AM	10:05AM	10:05AM	10:05AM	10:05AM	10:05AM - 10:25AM	10:05AM - 10:25AM
	<p><b>SESSION 8</b> <b>Design &amp; Optimization I</b> Chair: Dr. Ryan Schmit AFRL</p> <p>DESS2018-034</p> <p>Aircraft Thermal Management Optimization using Reinforcement Learning</p> <p>Andrew Elliott - WSU</p>	<p><b>SESSION 9</b> <b>Humanitarian Engineering II</b> Chair: Dale Harlan SIM</p> <p>DESS2018-092</p> <p>A Cultural Approach to Implementing Successful Technology – the Development of a 10-Meter Hand Pump</p> <p>Dale Harlan - SIM</p>	<p><b>SESSION 10</b> <b>Biomechanics II</b> Chair: Dr. Megan Reissman UD</p> <p>DESS2018-043</p> <p>A Review of Below-Knee Socket Materials Using Finite Element Analysis</p> <p>Mohamed Mousa - WSU</p>	<p><b>SESSION 11</b> <b>Fluid Dynamics &amp; CFD II</b> Chair: Dr. Sidaard Gunasekaran UD</p> <p>DESS2018-027</p> <p>The Effect of Momentum Flux Ratio on Spray, Vaporization and Combustion Characteristics of Kerosene Jet in Air Crossflow</p> <p>Mama Kamin - UC Dr. Prashant Khare - UC</p>	<p><b>SESSION 12</b> <b>Manufacturing</b> Chair: Dr. Robert Lowe UD</p> <p>DESS2018-037</p> <p>Laser Powder Bed Additive Manufacturing In Situ Defect Detection using Three Color Spectroscopy</p> <p>Andrew Drieling - WSU Joe Walker, Nathan Klingbeil - WSU John Middendorf - UTC Glen Parram - AFRL</p>	<p><b>SESSION 13</b> <b>STEAM+ Track II</b> Chairs: Dr. Kevin Hallinan; Matt Szozda - UD</p> <p>10:25AM - 10:50AM</p> <p><b>Synvention, Sycamore Schools STEAM program</b></p>	<p><b>COMBUSTION &amp; DIAGNOSTICS</b> Chair: Dr. Brent Rankin AFRL</p> <p>* DESS2018-019 *</p> <p>Analyzing the Relative Impact of Spray and Volatile Fuel Properties on Gas Turbine Combustor Ignition</p> <p>Katherine Opacich - UD Dr. Joshua Heyne, Erin Peiffer - UD Dr. Scott Stouffer - UDRI</p>
	<p>* DESS2018-009 *</p> <p>Minimizing Takeoff and Landing Operational Area for Fixed-Wing sUAS</p> <p>Nicholas Degroote - UC Anthony Lamping - UC Austin Wessels - UC Dr. Kelly Cohen - UC</p>	<p>DESS2018-089</p> <p>3D Printing Houses in Auroville, India</p> <p>Andrea Mott - UD Grant Ross - UD Jason Demeter - UD</p>	<p>DESS2018-075</p> <p>Detrended Fluctuation Analysis for Posture Data</p> <p>Vinayak Vijayan - UD Dr. Jenna Yentes - UNO Dr. Christine Kabbian Schubert - AFIT Dr. Kimberly Bigelow - UD</p>	<p>DESS2018-036</p> <p>DNS Study on Turbulence-Flame Interactions for Premixed Acetylene-Air Mixtures</p> <p>Himakar Ganit - UC Dr. Prashant Khare - UC</p>	<p>DESS2018-040</p> <p>Modeling of Alloy 718 Microstructure Through Multi-Sensor In-Situ Physics Based Monitoring</p> <p>Joe Walker - WSU John Middendorf - ADT Glen Parram - AFIT Nathan Klingbeil - WSU Joy Gockel - WSU</p>	<p>10:25AM - 10:50AM</p> <p><b>Brian LaDuca, UD, Institute for Applied Creativity Director, Kevin Hallinan, Professor, Mechanical Engineering</b></p> <p>*GEMnasium: A Transdisciplinary Educational Curriculum and Space Addressing Human Needs in Dayton.* Will describe their experiment with 10 classes from different disciplines, 14 faculty, and 270 students addressing the Dayton addiction crisis.</p>	<p>DESS2018-055</p> <p>Assessment of Lean Blowoff in a Toroidal Jet Stirred Reactor</p> <p>Robert Staehler - UD Dr. Joshua Heyne, Erin Peiffer - UD Dr. Scott Stouffer - UDRI Dr. Joseph Miller - AFRL</p>
	<p>DESS2018-045</p> <p>Design of a Transitional Vertical Takeoff and Landing Quadplane Prototype</p> <p>Nicholas Little - UC Austin Wessels - UC Nicholas DeGroot - UC Davin Walker - UC Dr. Kelly Cohen - UC</p>	<p>DESS2018-074</p> <p>Post Combustion Methods for Emission Reduction in Small Scale Combustion: A Literature Review</p> <p>Craig Attenweiler - UD Dean Still - ARC</p>	<p>DESS2018-076</p> <p>Linear Time Invariant Models of Human Ankle Impedance Based on System Identification Techniques During Motion Tasks</p> <p>Li Zhi - UD Dr. Timothy Reissman - UD</p>	<p>DESS2018-044</p> <p>Numerical Design of an Experiment to Investigate Rayleigh-Taylor Instabilities in Reacting Flows</p> <p>Joshua Sykes - ISSI Dr. Timothy Gallagher - ISSI Dr. Brent Rankin - AFRL</p>	<p>DESS2018-049</p> <p>Effect of Surface Topography and Sub-surface Microstructure of Wire Electric Discharge Machined Ti-6Al-4V on its Biocompatibility</p> <p>Mid Rashid Mahbub - MU Rohan Kirwin, Paul F. James - MU Dr. Muhammad P. Jahan - MU</p>	<p>10:45AM</p> <p>The Role of High Energy Molecules and Alternative Jet Fuel Blends in the Advancement of Conventional Jet Fuels</p> <p>Lily Behnke - UD Shane Kosir, Dr. Joshua S. Heyne - UD Steven Zaharnick, Giacomo Flora - UDRI Russell K. Demney - GT Mohan Gupta - DOE DESS2018-007</p>	<p>DESS2018-020</p> <p>Improvement in Jet Aircraft Operation with the Use of High-Performance Alternative Drop-in Fuels in Conventional Fuels</p> <p>Shane Kosir - UD Lily Behnke, Dr. Joshua S. Heyne - UD Steven Zaharnick, Giacomo Flora - UDRI Russell K. Demney - GT Mohan Gupta - DOE DESS2018-007</p>
	<p>DESS2018-024</p> <p>Characterization and Testing of Downward Facing Surface Roughness Impacting Performance in Additive Manufacturing</p> <p>Eric Tamman - WSU Joy Gockel - WSU</p>	<p>DESS2018-033</p> <p>A Novel Clean Energy Neighborhood Utility In Under-served Communities</p> <p>Micah Bidwell - UD Nick Serra, Katie Van Horn - UD Humad Almadhi, Tess Isenmann - UD Dr. Kevin Hallinan, Brad Keister - UD</p>	<p>DESS2018-077</p> <p>Comparison of Linear Parameter Varying Versus Linear Time Invariant Models of Human Joint Impedance</p> <p>Shanpu Fang - UD Dr. Timothy Reissman - UD</p>	<p>DESS2018-067</p> <p>A Flow Feature Focused Mesh Convergence Study</p> <p>Troy Lanchinan - WSU Dr. Mitch Wolff - WSU Dr. Michael List - AFRL</p>	<p>* DESS2018-051 *</p> <p>Machining of High Aspect Ratio Micro-holes on Metallic Glass by Micro EDM Drilling</p> <p>Chong Liu - MU Dr. Muhammad P. Jahan - MU</p>	<p>11:00AM - 11:25AM</p> <p><b>Community Brainstorming Event</b> It takes a village - "How can WE help to create unique education for SW Ohio...and beyond?"</p>	<p>DESS2018-048</p> <p>Effect of High Centrifugal Acceleration on Propane-Air Flames</p> <p>Shane Kosir - UD Lily Behnke, Dr. Joshua S. Heyne - UD Steven Zaharnick, Giacomo Flora - UDRI Russell K. Demney - GT Mohan Gupta - DOE DESS2018-048</p>
	<p>DESS2018-017</p> <p>Analysis of a Celestial Icosahedron Vacuum Lighter than Air Vehicle</p> <p>Dustin Graves - AFIT Dr. Anthony Palacotto - AFIT Joshua Dewitt - AFIT Kyle Moore - AFIT Dr. Mitch Wolff - WSU</p>	<p>DESS2018-083</p> <p>Understanding Chemolithotrophic Reduction Mechanisms from the Dark Marine Biosphere</p> <p>Anna Blair - UD Justin Bliffinger - UD</p>	<p>DESS2018-083</p> <p>Use of virtual reality to modify beam walking performance</p> <p>Dr. Megan Reissman - UD Jack Kinath - UD Bridget Dues - UD Emily Lusk - UD</p>	<p>* DESS2018-072 *</p> <p>Effect of Curved Boundary Layer Fences on Aerodynamic Efficiency</p> <p>Asa Palmer - UD Dr. Sidaard Gunasekaran - UD</p>	<p>DESS2018-082</p> <p>Investigating the Effect of Wire Feed Rate Wire Tension, and Surface Feed Rate on the Surface and Sub-surface Characteristics of Ti-6Al-4V Alloy</p> <p>Rohan Kirwin - MU Dr. Muhammad P. Jahan - MU</p>	<p>11:25AM - 12:00AM</p> <p><b>Demos and Posters on Humanitarian Engineering and Science</b></p> <p>Students from K-16 will present their work on humanitarian engineering and science</p>	<p>DESS2018-045</p> <p>Effect of High Centrifugal Acceleration on Propane-Air Flames</p> <p>Shane Kosir - UD Lily Behnke, Dr. Joshua S. Heyne - UD Steven Zaharnick, Giacomo Flora - UDRI Russell K. Demney - GT Mohan Gupta - DOE DESS2018-045</p>
11:45AM	Break						





160 - Apollo Room						
12:00PM	Lunch and Networking (Visit Buffet and be Seated)					
12:30PM	<p><b>Welcome &amp; Opening Remarks:</b> Dr. Josh Heyne, 14<sup>th</sup> DESS Chair  <b>Keynote Address:</b> "Humanitarian Engineering"                  Dean Still, Executive Director of Approvecho Research Center</p>					
1:40PM	Break					
Room	Endeavour 156A	Endeavour 156B	Endeavour 156C	Discovery 163A	Discovery 163B	Atlantis 157A
Time	SESSION 15	SESSION 16	SESSION 17	SESSION 18	SESSION 19	SESSION 20
	<b>Design &amp; Optimization II</b> Chair: Dr. Kirk Johnson AFIT	<b>Assistive Technology</b> Chair: Dr. Timothy Reissman UD	<b>Biomedical</b> Chair: Dr. Tushar Goswami WSU	<b>Fluid Dynamics &amp; CFD III</b> Chair: Dr. Rachelle Speth AFRL	<b>Materials II</b> Chair: Dr. Giancarlo Corti MU	<b>Thermal &amp; Fluid Systems</b> Chair: Dr. Carl Timmann AFRL
1:40PM	DESS2018-065 CubeSat Payload Thermal Management Optimization <i>Matthew Krott - AFIT Robert Bettinger - AFIT</i>	DESS2018-016 The effect of ankle foot orthosis fitting and footwear tuning on gait and balance in persons with neurological disorders <i>Sarah Hollis - UD Dr. Kimberly Bigelow - UD Dr. Kurt Jackson - UD</i>	DESS2018-004 Integrating Human Cognitive Factors into Applicable Technology using DEJH Systems Model <i>Adeleji Badiru - AFIT Sharon Bommer - UD</i>	DESS2018-066 Design and Characterization of Wind Lens Grid Array <i>Neal Novotny - UD Dr. Sidaard Ganasekaran - UD</i>	DESS2018-035 Carbon Nanotube Carpets as Membranes for Fluid Separation <i>Kimia Kiaei - WSU Sharmila Mukhopadhyay - WSU</i>	DESS2018-005 Simulation Case Studies on Vapor Cycle Control Strategies <i>Sunderlin Jackson - AFIT Drs. Anthony Paloczani, Mark Fischer - AFIT Dr. Nicholas Niedbalski - AFRL</i>
2:00PM	DESS2018-080 Effect of the applied load on multi-physics modeling of a high frequency microstrip patch antenna. <i>Aamir Hamad - WSU Dr. Ahsan Mian - WSU</i>	DESS2018-015 A Review of Distal Femoral Endoprostheses and Investigation of Stresses at the Fixation Site Using Finite Element Analysis <i>Zach Brooks - WSU Dr. Tarun Goswami - WSU</i>	DESS2018-031 Development of Human-Automated Decision-Aid Interaction Analysis <i>Isabelle Baird - WSU Mary Fendley - WSU Rik Warren - AFRL</i>	DESS2018-070 Simulations of The Empty WICS Cavity and Comparisons to Experiment <i>Dr. Rachelle Speth - AFRL</i>	DESS2018-039 Texture Evolution in Materials with Layered Crystal Structures <i>Vamsi Krishna Vempati - WSU Dr. Raghavan Srinivasan - WSU</i>	DESS2018-010 Effective Power Generation with High-Temperature Fuel Cells in Hypersonic Vehicles <i>Jack Chalkear - WSU Drs. Rory Roberts, Mitch Wolff - WSU Dr. Stanley Rodrigues - AFRL Dr. Praveen Cheekatamarla - AE</i>
2:20PM	DESS2018-078 Limited Duty Cycle Satellite Formation Control via Differential Drag and Lift <i>Talon Townley - AFIT Dr. Kirk W. Johnson - AFIT</i>	DESS2018-046 Upper Limb Prosthesis: A Review of the History, Advancements, and Materials <i>Alicia Runser - WSU</i>	DESS2018-062 Damage Accumulation of Nail Constructs for Femoral Fractures <i>Farah Hamandi - WSU Dr. Tarun Goswami - WSU</i>	DESS2018-059 Investigation of Endwall Vortex Manipulation in High Lift Turbines caused by Periodic Focusing <i>Horatio Babcock - AFIT Dr. Mark Reeder - AFIT Dr. Christopher Marks - AFRL</i>	DESS2018-042 TiO <sub>2</sub> Nanostructured Coatings to Promote HA Deposition <i>Morgan Humphreys - MU Dr. Giancarlo Corti - MU</i>	DESS2018-081 Effects of Fan Blade Blending on Unsteady Aerodynamics <i>Clint Knapke - WSU Dr. Mitch Wolff - WSU Dr. David Johnston - AFRL</i>
2:40PM	DESS2018-079 Optimal Inspection of a Nadir-Pointing Satellite with Dynamic Angle Constraints <i>Mark Mercier - AFIT Dr. Kirk W. Johnson - AFIT</i>	DESS2018-056 Myoelectric Prosthetics and Signal Applications <i>Brandon Lease - WSU</i>	DESS2018-086 Investigation of Retrieved Cardiac Devices <i>Anmar Saith - WSU Dr. Tarun Goswami - WSU</i>	DESS2018-068 Characterization of a Periodic Unsteadiness Generator <i>Nathan Fletcher - AFRL Christopher Marks, Rolf Sondergaard - AFRL Dr. Mitch Wolff - WSU</i>	DESS2018-054 Comparing Empirical Residual Stress Measurements to FE Stress Fields <i>Colin Engebretsen - AFIT Dr. Anthony Paloczani - AFIT Dr. Kristina Langer - AFRL</i>	DESS2018-094 Ignition Study of a Swirl-Stabilized Single-Cup Combustor Under Altitude Conditions <i>Jennifer Colborn - UD Tyler Henderson, Dr. Scott Stauffer - UDRI Drs. Edwin Corcoran, Andrew Caswell - AFRL</i>
3:00PM	DESS2018-064 Influence of Weight and Strut Angle on the Elastic Mechanical Response of 3D Printed Polymer Lattice Structures <i>Hasanain Abdalrhadi - WSU Dr. Ahsan Mian - WSU</i>	DESS2018-050 Failure Analysis of Prematurely Failed Total Knee Replacement Liners Using Damage Scoring of Wear Mechanisms and FEM Simulations <i>Mikayla Padgett - WSU</i>	DESS2018-038 Modeling Amputee Gait and Energy Dissipation <i>Dr. Tushar Goswami - WSU</i>	DESS2018-057 Changes in Propeller Performance Due to Ground Proximity <i>Jielong Cai - UD Dr. Sidaard Ganasekaran - UD Michael Ol - FOI, Anwar-Almehdi - AUB</i>	DESS2018-012 Self-Healing Materials and their Application to the United States Air Force <i>Derek Spear - AFIT Dr. Anthony N. Paloczani - AFIT</i>	
3:00PM	DESS2018-063 Equivalent Material Model for Lattice Cell Structures using Numerical Modeling and Neural Networks Approaches <i>Tahseen Alwattar - WSU Dr. Ahsan Mian - WSU</i>		DESS2018-023 Effect of Slotted Winglet on the Wingtip Vortex <i>Josh Deslich - UD Dr. Sidaard Ganasekaran - UD</i>			
3:40PM	Adjourn					





Skylight Lobby

11:30AM - 12:05PM Poster Session

<p><i>DESS2018-002</i></p> <p><b>Visually Impaired Enhance System</b></p> <p>Shifan Luo - MU <i>Carlos Garcia-Fuentes - MU</i> <i>Rachel Kevdzija - MU</i> <i>Nicole Sherman - MU</i></p>	<p><i>DESS2018-011</i></p> <p><b>Mapping of the Sustainable Development Goals to the University of Dayton's ETHOS Program</b></p> <p>Erin Peiffer - UD <i>Dr. Malcolm Daniels - UD</i></p>	<p><i>DESS2018-032</i></p> <p><b>Quantifying Permafrost Extent, Condition, and Degradation Rates at Department of Defense Installations in the Arctic</b></p> <p>Theodore Labedz - AFIT <i>Major Steven J Schuldt - AFIT</i></p>	<p><i>DESS2018-093</i></p> <p><b>Measuring the Nonlinear Optical Properties of Thin Film Scandium Nitride</b></p> <p>Ava Kuperman - KHS <i>Dr. Carl Liebig - AFRL</i> <i>Major Manuel Ferdinandus, PhD - AFIT</i></p>
<p><i>DESS2018-069</i></p> <p><b>Optimization of Surrogate Jet Fuel for Determination of Combustion Properties and Sensitivities</b></p> <p>Harrison Yang - UD <i>Shane Koxir, Robert Staehler, Erin Peiffer - UD</i> <i>Dr. Joshua S. Heyne - UD</i></p>	<p><i>DESS2018-084</i></p> <p><b>Mechanical Property Characterization and Finite-Element Modeling of Ultra-Stretchable FDM-3D-Printed Elastomers for Soft Prosthetics</b></p> <p>Luke Hoover - UD <i>Brad Hripko, Robert Lowe - UD</i> <i>Dr. Timothy Reissman - UD</i></p>	<p><i>DESS2018-087</i></p> <p><b>Low-Cost Pump Design and Fabrication by Appropriate Technology Engineering Students</b></p> <p>Thomas Thompson - CDU <i>Kenneth Coppins - CDU</i></p>	<p><i>DESS2018-095</i></p> <p><b>Effect of Inverted PVDF in Free Shear Layer Wake</b></p> <p>Grant Ross - UD</p>

Abbreviations:

ADT = Advratech  
 AE = Antrex Energy  
 AFIT = Air Force Institute of Technology  
 AFRL = Air Force Research Laboratory  
 ARC = Aprovecho Research Center  
 AUB = Auburn University  
 BUR = Burro  
 CDU = Cedarville University  
 DOE = Department of Energy  
 DRSS = Dayton Regional STEM School  
 FOL = Folderol, LLC  
 GT = Georgia Institute of Technology  
 ISSI = Innovative Scientific Solutions Inc.  
 KHS = Kettering High School  
 MU = Miami University  
 SIM = SIM-USA  
 UC = University of Cincinnati  
 UD = University of Dayton  
 UDRI = University of Dayton Research Institut  
 UNO = University of Nebraska at Omaha  
 UTC = Universal Technology Corp.  
 WSU = Wright State University



# KEYNOTE SPEAKER

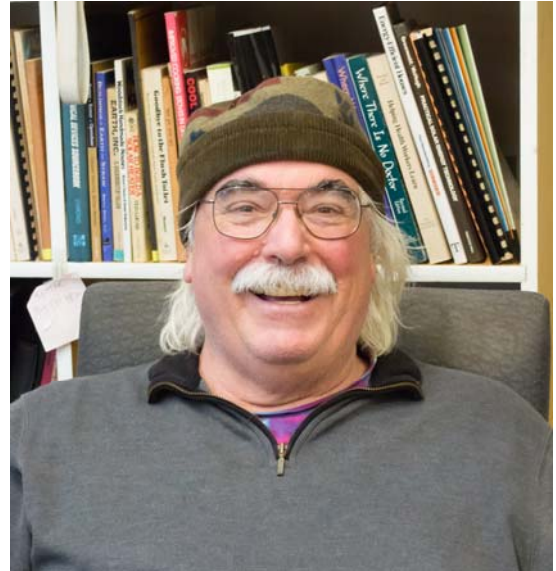
## Topic: Humanitarian Engineering

**Dean Still** is the Executive Director of Aprovecho Research Center and CEO of ASAT, Inc. in Cottage Grove, Oregon. He began his work in biomass stoves in 1989 and has written many versions of what are considered reference manuals for cook stove designers around the world.

Dean began his career inspired by the writings of Mahatma Gandhi and E. F. Schumacher who defined Appropriate Technology as designed by, constructed, and repaired by the user. Unfortunately, the early high mass stoves often ended up using more fuel and making more smoke than an open fire. Stove improvements have moved Aprovecho into new worlds of computer assisted emission testing, extensive in field

collaborations, and difficult to manufacture materials like refractory ceramics. Making an affordable, \$10 stove that meets ISO standards currently involves factories and large scale distribution, hopefully to one day include selling at box stores like Wal-Mart. Although the best stoves cannot be home-made, like most things in 2018, the stoves continue to be heavily dependent on consumer input at every stage of the project.

Dean will discuss some of the theoretical constructs of 'helping people' in the developing world as well as relating successes and failures from decades of collaborations with NGOs, EPA, DOE, governments, Gates Foundation, etc. and working in more than 40 countries.



### Academic Representatives

AFIT – Adedeji Badiru	University of Dayton – Tim Reissman
Cedarville University – Tim Dewhurst	UDRI – John Leland
Ohio State University – Datta Gaitonde	Wright State University – Joy Gockel
University of Cincinnati – Ephraim Gutmark	ASME Dayton Section Chair – Joe Miller

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