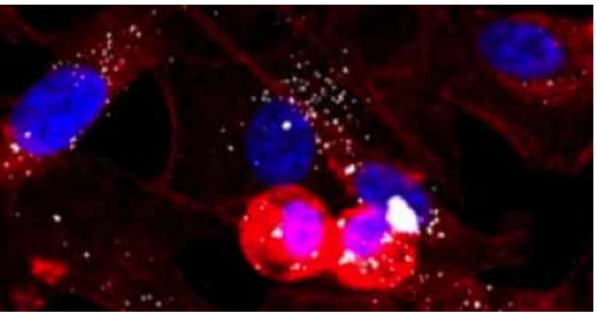

SCHOOL OF ENGINEERING

SCHOLARSHIP
2013 - 2014

UNIVERSITY of DAYTON

University of Dayton School of Engineering

Scholarship 2013 and 2014

At the University of Dayton School of Engineering, we are motivated by 'Engineering that Matters' — engineering with a higher purpose.

As a top-tier Catholic research university, we are recognized for outstanding engineering research that

1) addresses critical needs of the world — Dr. Aaron Altman, director of Aerospace Graduate Program, employs exergy metrics and takes a fresh look at the formation of the wingtip vortex to reduce aircraft drag to improve aircraft fuel efficiency;

2) addresses critical needs of humanity — Dr. Kristen Comfort, director of Bioengineering Graduate Program, proves that *in vivo* replication of the complex physiological systems aids in the development of enhanced predictive systems and nanoparticle safety;

3) addresses critical needs of our environment and humankind — Dr. Kenya Crosson protects our drinking water from undesirable elements and promotes awareness of engineering designs that assist disabled farm owners and workers through AgrAbility;

4) provides economic growth to our region and the world — Dr. Andrew Sarangan, director of Nanofabrication and Nanophotonics Cleanroom Laboratory, develops new nanoscale materials that can emit, detect, and manipulate light and designs new device concepts for boosting their performance;

5) positively advances the human condition — Dr. Kellie Schneider employs "community-based operations research" to assist our area Food Bank that serves over 125,000 people who are food insecure.

Following our Catholic, Marianist tradition to understand social and global awareness and serve as leaders, we are committed to graduating engineers who are ready to make an impact on the environment, the human condition and the world.

Eddy Rojas

Dean, School of Engineering

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Karen Updyke - Editor/Designer July 1, 2016

DR. AARON ALTMAN, PROFESSOR

Department of Mechanical and Aerospace Engineering

Aaron Altman, professor at the University of Dayton School of Engineering, shares his aerospace enthusiasm with students and colleagues nationally and internationally through his scholarship.

Altman, 2015 recipient of the Alumni Award in Teaching, directs the Graduate Aerospace Program, the Low Speed Wind Tunnel (LSWT) Laboratory, and the Flight Simulator Laboratory and teaches Introduction to Flight, Aerospace Design, Engineering Design, and Experimental Aerodynamics for the School of Engineering.

Currently, Altman focuses his research on drag reduction. One path that he and his students take to achieving this is through exergy research. Exergy determines the amount of available energy, which can lead to the identification of energy wasted through suboptimal processes. This knowledge can then be used to optimize processes to reduce the wasted energy. Exergy metrics identify inefficiencies and losses, and in aerospace engineering, the metrics can identify ways to lower fuel burn, improve overall aerodynamic performance and reduce lift-induced drag. Altman believes that evaluating aircraft drag/wakes through the lens of exergy can increase fuel economy and benefit our U.S. economy and the environment.

As a frequent collaborator in aerospace and a lifelong learner, Altman continues to advance his knowledge as a representative for UD (and sometimes for the USAF Research Labs) to the Subsonic Aerodynamic Testing Association (SATA). SATA is a worldwide association that provides a medium for the interchange of ideas, techniques and solutions for those involved in low speed aerodynamic testing.

In addition, Altman advises the University's student Aero Design Team, the student section of the American Institute of Aeronautics and Astronautics, and the It Flies Competition Team.

As the It Flies adviser, Altman coordinates the annual It Flies competition at the University of Dayton, where Air Force test pilots, from Majors to Brigadier Generals, evaluate student designs by using our Flight Simulator Laboratory. Altman champions student designs ranging from Light Sport Aircraft, Transport Aircraft, Firebombers, Crop Dusters, Military Trainers, to Red Bull Racers. Several student projects have been sponsored by the USAF and local companies.

The simulator, in combination with individual conceptual designs, Altman says, "empowers the students. They cannot slack because their airplane's performance in the flight simulator is true to life, and the students become engaged in perfecting their designs . . . it is an incredibly rich learning environment."

The full-motion simulator literally provides the user with a feel for how the plane flies allowing them to close the loop on their designs in ways unavailable to students at other schools.

The hands-on flight simulator gives the students what the classroom cannot — a grasp as to the how and why a plane performs in a certain way. It is testing within a controlled environment. "The experimental test pilot feedback further enriches the experience by providing them insight into the world of handling qualities and flight testing that they then must incorporate into their designs," says Altman.

By integrating the simulator lab with the design process class, students understand how their design decisions affect the equations that determine the flight dynamics and handling characteristics of their airplanes. When taking the stick in the cockpit of the simulator and maneuvering the aircraft, the student quickly realizes how well (or if!) any oscillations dampen out as well as the oscillation period and amplitude.

Recently, during the British It Flies competition, two Dayton students, Alex Watt and Matt Pulfer, teamed up and won first place after impressing the test pilots with their simulation of the Wright B Flyer Silver Bird.

Beginning with flight simulator tests, Watt and Pulfer created a model of the new Silver Bird design that will be built in Dayton, Ohio, at the original Orville and Wilbur Wright factories. Wright B Flyer, Inc., a non-profit corporation, and the National Aviation Heritage Alliance (NAHA) support the project.

Altman's ongoing aerospace efforts continue to influence students and colleagues around the world.

Merlin Flight Simulator Lab, University of Dayton, School of Engineering Eugene W. Kettering Engineering and Research Labs

DR. KRISTEN COMFORT, ASSISTANT PROFESSOR

Department of Chemical and Materials Engineering

Kristen Comfort, assistant professor at the University of Dayton School of Engineering was recently named director of the Bioengineering Graduate Program.

As director of bioengineering, she promotes a selective, high-quality, multi-disciplinary program, and the University's Bachelor's-Plus-Master's program provides a pipeline of undergraduate science, technology, engineering and mathematic (STEM) seniors to grow the program. Comfort seeks students with leadership skills and a vested interest in bioengineering to maintain the rigor and quality of the program.

As professor and research scientist in chemical engineering and biotechnology, Comfort's interests complement her role as bioengineering director. She focuses on the impact of nanomaterials in the bioengineering field and teaches in the areas of material and energy balances, thermodynamics, fluid flow and heat transfer, transport phenomena in biological systems, and research methods. With practical models, Comfort makes the abstract easier for her students and uses research references that generate enjoyment and interest.

In the *Journal of Nanobiotechnology*, Comfort, along with Emily K. Breitner and Saber M. Hussain, published, "The role of biological fluid and dynamic flow in the behavior and cellular interactions of gold nanoparticles," which documents the feasibility of *in vitro* model improvements with physiological variables. By replicating biological fluid and dynamic flow, an enhanced *in vitro* model is developed.

Nanomaterials have been studied *in vitro*, but Comfort investigates how they behave when the *in vivo* environment is replicated *in vitro*.

Comfort, Alexandra O. Luby and Emily K. Breitner, published, "Preliminary protein corona formation stabilizes gold nanoparticles and improves deposition efficiency," in *Applied Nanoscience* to demonstrate the possibilities and the challenges of using the protein corona to influence nanoparticle behavior.

Gold nanoparticles are used for a number of applications because of their biocompatibility. The protein corona surface masks the nanoparticle, and preformed protein corona particles stabilize and maintain the nanoparticle characteristics for drug delivery, cancer therapy and multiple other applications that depend on certain properties of the particle.

In the future, Comfort will continue to bridge the *in vitro in vivo* gap to advance the standard *in vitro* methodologies. She has proven that *in vivo* replication of the complex physiological systems will aid in the development of enhanced predictive systems and nanoparticle safety.

Beginning her engineering track at the University of Dayton, Comfort graduated with a bachelor's degree in chemical engineering.

Afterwards, she attended North Carolina State University, where she received her Ph.D. in the fields of chemical engineering and biotechnology. Her application for a National Research Council Post-Doctoral Fellow with the Air Force Research Laboratory (AFRL) was accepted, and for the first time, her research centered on *in vitro* toxicity. Saber Hussain, Ph.D., AFRL toxicologist, with expertise in nanotoxicity and nanobiotechnology, encouraged Comfort to discover her niche, thus began her nanomaterials' research from an engineer's viewpoint.

Comfort is a member of the American Institute of Chemical Engineers, Materials Research Society, Society of Biological Engineering, Sigma Xi and Tau Beta Pi and faculty adviser of Chi Omega Epsilon and Tau Beta Pi.

As a UD undergraduate student, Comfort was an enthusiastic researcher and developed her passion for bioengineering. When she returned to UD as a faculty member, her love of teaching was confirmed. Now, she follows her research passion as the director of the Bioengineering Graduate Program and is respected as both—enthusiastic researcher and inspirational professor.

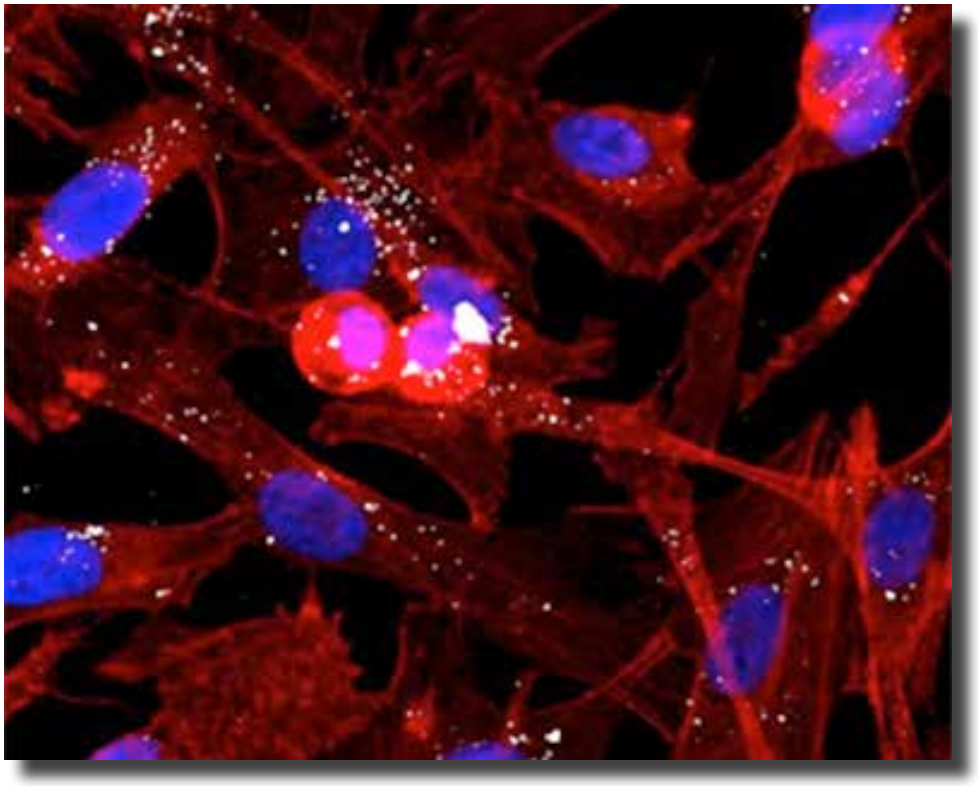


Image of the human, lung co-culture under dynamic flow following exposure to silver nanoparticles. The cells underwent actin (red) and nuclear (blue) staining with the silver nanoparticles appearing as white. The macrophages are easily identifiable because of their globular nature versus the lamellipodia spreading of the epithelial cells.

DR. KENYA CROSSON, ASSOCIATE PROFESSOR

Department of Civil and Environmental Engineering and Engineering Mechanics

Kenya Crosson, associate professor at the University of Dayton School of Engineering, walks multiple avenues in her teaching and research work.

Originally from Dayton, Crosson was young when her family moved to rural North Carolina, and environmental issues touched her life. Because of her father's work as a health administrator, she noticed an increase in rare cancers in the area, which developed her curiosity about water systems, the environment and human health.

From that point, the environment motivated her research. To protect our drinking water from undesirable elements, Crosson's research spans water + environment + energy + agriculture.

One chemical additive in particular, denatonium benzoate, a bittering agent, has been on Crosson's research radar because of state governmental mandates.

To prevent accidental deaths by ingestion, antifreeze manufacturers voluntarily add the bitter denatonium benzoate to their products. Antifreeze has a sweet taste, so the bittering agent prevents children and pets from ingesting large amounts of the deadly substance.

Denatonium benzoate is likely to enter water supplies through runoff or illegal discharges containing antifreeze amended with the bitter additive. Recently, Crosson and her husband, Garry, published in the *Journal of Water Resource and Protection*, "Activated carbon and clay minerals for the sorptive removal of denatonium benzoate from water," which confirms that by using traditional sorbents, carbon or clay minerals, we can lower the amount of the bittering agent in our drinking water.

Currently, Crosson combines carbon and oxidation to optimize the removal of denatonium benzoate from water. Crosson says, "Carbon alone does not lower the denatonium benzoate concentration enough, but including activated carbon with oxidation, the level of the off-flavor is lowered enough to be undetected in the drinking water." Her experiments with carbon and oxidation sequencing found that "when oxidation precedes sorption, the activated carbon sorption ability is diminished."

In addition to her research, she advises and mentors undergraduate and graduate students on their research on the removal of microcontaminants and emerging contaminants from water using filtration and adsorption. They tailor natural and engineered sorptive media for removal of contaminants in agricultural runoff, which promises to provide new, exciting applications and treatments.

Always closely attuned to human needs and agriculture, Crosson's cross-collaborations as research scientist and professor benefit AgrAbility, a national agricultural program with a mission to keep disabled farmers and other

agricultural workers in their professions. The goal of AgrAbility is a safe farming environment.

Ohio is a large agricultural state, and Crosson contributes to student awareness about this previously unconsidered field of study — engineering designs for farming solutions.

In 2009, Crosson contacted AgrAbility as a client for the first-year engineering design course, EGR 103 Engineering Innovation, and the collaboration developed. At that time, she visited a paraplegic farmer to understand how he was able to work on his farm and to research how students in her engineering design class could enhance his capabilities. Crosson mentors students who develop open-ended projects that assist AgrAbility.

Along with design solutions, she and her students attend the Ohio State University's annual Farm Science Review, a large outdoor meeting that showcases agricultural innovations and resources, where they showcase their EGR 103 student designs. The Review demonstrates not only biological engineering capabilities but also the technical side of agriculture with designs that improve safety. The AgrAbility program and the disabled farmers and farm workers have inspired Crosson and her engineering design students to identify problems and discover solutions to help.

In 2014, as invited speakers to the American Society of Agricultural and Biological Engineers International Meeting in Montreal, Canada, Crosson, along with S. Dee Jepsen, K. McGuire and J. Zeller, were able to disseminate their AgriAbility knowledge and successes. Their topics included, "Ohio AgrAbility Design Solutions Developed In A First-Year Engineering Innovation Course" and "Incorporating AgrAbility Projects into the University of Dayton First-Year, Service-Learning, Engineering Design Course."

Crosson attended North Carolina Agricultural and Technical State University and received her B.S. in agricultural and biosystems engineering. Crosson received her M.S. and Ph.D. in environmental engineering from the Pennsylvania State University.

As her scholarship moves forward, Crosson examines new fields of study, new innovations and exciting future applications along a variety of avenues that will continue to benefit our environment and humankind.

City of Dayton, Ohio, and the Great Miami River

DR. ANDREW SARANGAN, PROFESSOR

Department of Electro-Optics and Photonics

Andrew Sarangan, professor at the University of Dayton School of Engineering, directs the Nanofabrication and Nanophotonics Cleanroom Laboratory.

Sarangan teaches and conducts research guided by the principles of engineering, i.e., to build innovative things that solve real life problems. He says, "Engineering requires a thorough understanding of mathematics and science. This is the fuel-air mixture. Innovation is the spark that ignites this mixture to do useful things."

In 2006, Sarangan built the Nano-Fab Lab entirely from externally sponsored research funding and has continued to operate and upgrade its capability with support from government and private companies.

Ten years later, the Lab's advanced capabilities include optical thin film deposition, photolithography, deep-UV nano-lithography, semiconductor diffusion and oxidation processes, and a variety of plasma etching capabilities.

Sarangan focuses on two research areas: photonic devices such as photodetectors, waveguides and polarizers, and optical thin film design and synthesis. He endeavors not only to come up with great ideas but also to build and test functional prototypes.

Nanofabrication is the key enabler that makes integrated circuits (electronic chips) possible. It involves synthesizing and depositing novel types of material, patterning these materials, and then removing them (etching) in a systematic manner.

The next-generation of electronic chips will inevitably include some photonic components. This requires the development of nanoscale photonic components that are compatible with electronic integrated circuit manufacturing and assembly processes. This is the overarching vision of Sarangan's research.

Specifically, his research includes developing new nanoscale materials that can emit, detect and manipulate light, and designing new device concepts for boosting their performance.

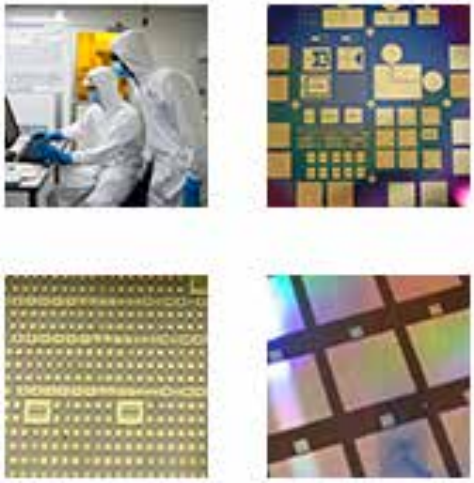
Sarangan uses a novel deposition method for creating nanostructured thin films with optical properties that can be engineered to meet specific characteristics.

He also developed a method to make silicon nanowires that exhibit unusual light absorption because of a quantum mechanical process known as sub-band absorption. He plans to utilize these materials in the next-generation photonic integrated circuits.

Sarangan's current grants include an Air Force funded project on "Interferometric Lithography," two projects funded by the National Science Foundation (NSF) and one funded by the Army Research Office.

One NSF project is a collaboration between Sarangan and Dr. Keigo Hirakawa, associate professor with the Department of Electrical and Computer Engineering. In it, they work to develop an image sensor that can record the full spectrum of color (or wavelengths) instead of the traditional red, green and blue. They plan on extending this concept to the infrared spectrum where the concept of color does not even exist.

In another project, in collaboration with Dr. Joseph Haus, professor with the Department of Electro-Optics and Photonics, and Dr. Imad Agha, assistant professor, Department of Physics and Electro-Optics, Sarangan works to develop a new method for detecting light using a phenomenon known as quantum tunneling through ultra-thin layers.



Nanofabrication and Nanophotonics Cleanroom Laboratory and Thin Films

In the past, Sarangan was principal investigator on an NSF grant to establish a nanotechnology curriculum to undergraduate engineering students. He worked with Sinclair Community College and created an innovative delivery method for enhancing the teaching methods used in nanotechnology education.

New on the horizon, Sarangan plans to build electro-optic chips for biologists, chemists and toxicologists to study how biological cells respond to various environments. Known as "organs on a chip," these are chips, not unlike electronic chips, that mimic the behavior of real organs, so responses to various stimuli and toxins can be studied easily, reliably and safely.

Sarangan's Nano-Fab Lab has the capability to enable conceptualizing and building prototypes of all of the aforementioned. He and his graduate students do everything in the lab to keep it operational, including maintenance and repairs. He insists that his students develop useful, practical skills, and focus on building things that people need. As Sarangan says, he is an "engineer, and engineers build useful things."

Sarangan's courses, labs and research projects appeal to a wide range of students. He came up with the idea of using a live interactive video system for teaching to a classroom directly from his cleanroom laboratory.

The video setup allows for greater accessibility to a larger number of students and saves time because students do not have to "gown-up," to enter the Lab. The system is like a super-broadband Skype with multiple cameras and multiple microphones. Sarangan can see and hear every student in the classroom, and the students can see every detail of the equipment or process that he is teaching.

Hands-on with state-of-the-art labs and mentoring describes Sarangan's teaching style. He teaches and conducts research with undergraduate and graduate students from multi-disciplines: electro-optics, electrical and computer engineering, mechanical engineering and materials engineering. His teaching oeuvre encompasses Nano Fabrication, Integrated Optics, Quantum Electronics, Nano Photonics, Optical Thin Films, and Advanced and Principles of Nanotechnology.

As testimony to his teaching and research efforts, Sarangan has been honored with the *Faculty Excellence in Teaching Award* from the Southwestern Ohio Council for Higher Education and the *Sigma Xi Noland Award for Excellence in Research*.

DR. KELLIE SCHNEIDER, ASSISTANT PROFESSOR

Department of Engineering Management, Systems and Technology

Kellie Schneider, assistant professor at the University of Dayton School of Engineering, says that her teaching philosophy uses "less lecture to facilitate student learning." She strives to develop courses that incorporate active learning, mastery-level assessment and service-learning opportunities for her students.

Schneider teaches a variety of classes including engineering analysis, quality assurance, reliability engineering, and probability and statistics. She also facilitates the departmental capstone project requirement.

Engineering management and systems classes are delivered online or simulcast over the internet via web conferencing software to accommodate the numerous working professionals enrolled. The simulcast sessions are recorded and available for asynchronous viewing, thus allowing students flexibility in how they complete their courses. Schneider admits that this is a challenging paradigm under which to work, but she says that she enjoys the challenge.

Currently, she and Department of Engineering Management, Systems and Technology colleague, Dan Zalewski, collaborate on "flipping" the classroom to incorporate learning-centered teaching approaches.

Recently, they revised their probability and statistics course to that of the "flipped classroom" by assigning readings and problems prior to the class sessions. During class, Schneider and Zalewski challenge the students with difficult problems related to their outside assignments.

Instead of traditional lectures, the flipped classroom provides students with the opportunity to work with others on authentic problems and receive personal, hands-on guidance during class time.

Engineering education and community are at the heart of Schneider's research.

While at the Univesity of Arkansas, she began her primary area of scholarship: *Operations research methodologies and reliability methods to model, evaluate and quantify the interactions of individuals and the dissemination of information within various organizations.*

"Qualitative analysis is important, but it is important to quantify too . . . . It is exploratory, and there are new insights that can be gained," says Schneider.

When modeling engineering student retention, Schneider graphs for quantifiable statistics through social networks and engineering education and their relationships with student retention. Important factors include: GPA, ethnicity, test scores and positive or negative outcomes of student attendance.

Using quantifiable metrics, her research outcomes assess the importance of social networks and the impact of diversity programs at the University. Schneider states that through

assessment, "We can experience the true diversity of community that we seek to have at the University of Dayton."

As a servant-leader, Schneider builds on her research efforts and assists our regional community Food Bank. Collaborating with Kelly Bohrer, Director of Community Engaged Learning at the Fitz Center, Schneider discovered that "There are over 125,000 people in the Miami Valley who are food insecure, and we have too much food in this country for anyone to be hungry. The Food Bank is an important agency that helps to relieve the situation."

Together with her students, Schneider focused on reducing Food Bank costs by optimizing operations. By addressing vehicle routing schedules, including the Food Bank auditor's travel routes, donation collections and donation deliveries, they successfully optimized Food Bank operations.

Recently, Schneider was awarded a Hanley Sustainability Institute summer grant, which enables her and two students to spend the summer working directly with the Food Bank on initiatives aimed at combating food insecurity in our area.

Reflecting on a University of Dayton faculty retreat, Schneider shared her personal vision statements:

- Engage in scholarly activities that (1) Improve the field of engineering education, (2) Provide practical solutions for our industry partners, and (3) Enhance the efforts of our community partners in combating poverty.
- Educate highly motivated, globally aware engineers that are capable of meeting the grand challenges required to advance civilization and ensure that our planet thrives.
- Serve both the University and the profession by participating in activities that align with my scholarship and educational goals.

At the University of Dayton, Schneider says that she has "found a unique place where I will be able to continue to grow both personally and professionally."

University of Dayton Porches

Department of Chemical and Materials Engineering

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Lafdi, K. 2013. Nanotechnologies. University of Mohammadia, in Morocco.

Lafdi, K. 2013. Paving the way: Nanotechnology. In Nantes, France.

Lafdi, K. 2013. Carbon sciences and technology. SAMPE, May.

Lafdi, K. 2013. Nano, the key technology for multifunctional composites. 2nd ACSD Symposium and 4th FASC Congress, May 7, in Marrakech, Morocco.

Lafdi, K., L. Guadagno, M. Raimondo, V. Vittoria, L. Vertuccio, B. De Vivo, P. Lamberti, G. Spinelli, and V. Tucci. 2013. Electrical properties of CNFs/epoxy-amine resin for aeronautic and aerospace applications. ICEAF III 3rd International Conference of Engineering Against Failure, June, in Kos Island, Greece.

Lafdi, K., L. Guadagno, M. Raimondo, V. Vittoria, L. Vertuccio, D. De Vivo, P. Lamberti, G. Spinelli, and V. Tucci. 2013. Exfoliated graphite as conductive filler in aeronautic epoxy mixtures. 3rd EASN Association International Workshop on AeroStructures Proc., October 9, in Milan, Italy.

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Lafdi, K., C. Meng, D. Solomon, and L. Li. 2013. Mechanical properties of fuzzy fibers as a function of CVD growth conditions. DESS.

INVITED LECTURES

Browning, C.E. 2014. Advanced composites. Seminar, AFRL, November, in WPAFB, Ohio.

Sandhu, S. 2013. Energy and lithium-based cell/battery. IICHE (Indian Institute of Chemical Engineers). Chandigarh Regional Center, Panjab University, October 28, in Chandigarh, India.

PRESENTATIONS

Black, W. , and **D. Comfort**. 2013. Biogenic fabrication of silver nanoparticles by Shewanella oneidensis. Annual Ohio Space Grant Consortium (OSGC) Student Research Symposium, NASA, Ohio Aerospace Institute, April 5, in Cleveland, Ohio.

Black, W. , A. Winner, and **D. Comfort**. 2013. Nanomaterials from cells: Biological synthesis of novel nanomaterials. Minority Leaders' Program Review, in Dayton, Ohio.

Black, W. , A. Winner, and **D. Comfort**. 2013. Biogenic fabrication of novel nanomaterials. AFRL Research Program Review, July 11, in Wright-Patterson Air Force Base, Dayton, Ohio.

Comfort, D., B. Stacy, K.K. Comfort, and S. Hussain. 2013. The use of hyperspectral imaging for the detection of gold nanorods in an in vitro system. AIChE, November 8, in San Francisco, California.

Comfort, D., E. Untener, K.K. Comfort, and S. Hussain. 2013. Enhanced intracellular concentration and endosomal release of gold nanorods through tannic acid functionalization: Implications for advancement in nano-based drug delivery mechanisms. AIChE, November 3, in San Francisco, California.

Comfort, K.K. 2014. Nanotoxicology: Past achievements, future challenges, and potential solutions. Society of Toxicology, in Phoenix, Arizona.

Comfort, K.K. 2013. Chronic in vitro exposure to low doses of silver nanoparticles identified distinct cellular consequences associated with long-term nanomaterial contact. Materials Research Society, April 5, in San Francisco, California.

Lee, C.W. 2013. Characterization of thicker high temperature resin panels using sensors. High Temple Workshop, February 5, in Muscle Shoals, Alabama.

Lee, C.W. 2013. Influence of service environment on thermo-mechanical performance of MVK-14 resin. High Temple Workshop, February 5, in Muscle Shoals, Alabama.

Janz, E.E., R. Strong, **K.J. Myers,** and A. Mays. 2014. Agitator design at high solids loadings. 2014 Annual AIChE Meeting, paper 143a, November 16-21 in Atlanta, Georgia.

Janz, E.E., **K.J. Myers,** N. Cathie, and M. Adams. 2014. Effective static mixing blending. 2014 Annual AIChE Meeting, paper 270b, November 16-21 in Atlanta, Georgia.

Myers, K.J., T. Bao, E.E. Janz, and R.J. Strong. 2014. Impeller power draw in liquid-solid systems. Mixing XXIV, June 22-27, in Lake George, New York.

Fasano, J.B., **K.J. Myers**, G.K. Patterson, and W.R. Penney. 2014. Recognizing the 25 most bottom-line economical fluid mixing developments. Mixing XXIV, June 22-27, in Lake George, New York.

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E.E. Janz. 2013. Gas dispersion with up-pumping Maxflo W impellers. 2013 Annual AIChE Meeting, paper 467c, November 3-8, in San Francisco, California.

Fasano, J.B., **K.J. Myers**, and E.E. Janz. 2013. Measuring blend time in laboratory agitated vessels: A case for the acid-base-indicator method. 2013 Annual AIChE Meeting, paper 259c, November 3-8, in San Francisco, California.

Sarwan, Sandhu, and Joseph P. Fellner. 2014. Characterization of iron phthalocyanine as the cathode active material for lithium-ion batteries. Indian Institute of Chemical Engineers, Panjab University, December, in Chandigarh, India.

ABSTRACTS

Sandhu, S., and J.P. Fellner. 2014. Characterization of iron phthalocyanine as the cathode active material for lithium-ion batteries. Panjab University, Chandigarh: Indian Institute of Chemical Engineers.

Sandhu, S., and J.P. Fellner. 2014. Experimental characterization of iron phthalocyanine as the cathode active material. New York: AIChE.

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Chiasson, A.D., **M. Elsass,** and J.S. Ervin. 2014. Studies of the low-temperature use of Jet A to replace JP-8 in tankers, fighters, bombers, and transport aircraft. AFRL-RQ-WP-TR-2014-0149 ed., WPAFB, OH: Air Force Laboratory-Fuels Branch.

Narvaez, J.A., **R.J. Wilkens**, M. Rumpfkeil, and H. Thornburg. 2013. Computational modeling of a microchannel cold plate: Pressure, velocity, and temperature profiles. AIChE National Conference, paper 340826, in San Francisco, California.

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Comfort, K.K. 2014. Partial reduction of silver nanoparticle dependent cytotoxicity and stress activation following magnetic field exposure. Society of Toxicology, in Phoenix, Arizona.

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Ma, Z., **K.J. Myers,** and E.E. Janz. 2014. Impeller power draw across the full Reynolds number spectrum. Mixing XXIV, June 22-27, in Lake George, New York.

Deng, J., **K.J. Myers,** and E.E. Janz. 2014. Impeller power draw in concentrated biomass slurry. Mixing XXIV, June 22-27, in Lake George, New York.

Narvaez, J.A., and **R.J. Wilkens**. 2013. Effect of surfactant drag-reduction agent on fluid flow and heat transfer for DI water flowing in a mock aviation coolant loop. AIChE National Conference, poster, in San Francisco, California.

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Browning, C.E. (Principal). Ohio research scholar in materials, State of Ohio, $4.5M.

Browning, C.E. (Principal). Minority Leaders, Clarkson Aerospace, Private, $2M. (September 2013 - Present).

Browning, C.E. (Principal). Center of Excellence in STEM and STEM Education, Central State University, State, $342,497. (June 3, 2011 - June 2, 2016).

Browning, C.E. (Principal). Aligned carbon nanotubes for efficient energy generation and storage devices, AFOSR, Federal, $75K. (August 2009 - Present).

Donaldson, S.L., T.J. Whitney, E. Toubia, **C.E. Browning**, and D.A. Klosterman. Center for research, education, and innovation: Advanced structures, processes, and engineered materials, Skolkovo Institute of Technology, $4.5M. (August 2013 - Present).

Skill, Thomas, Vijayan Asari, Shuang-Ye Wu, **C.E. Browning,** and Andrew M. Sarangan. CC-NIE network infrastructure:

Network 10Gb upgrade and science DMZ implementation to support science and engineering research and enhance outreach for high school STEM education. National Science Foundation, Federal, $232,788. (December 2013 – November 2015).

Ciric, A.R., and J. Reid. Chemical engineering entrepreneurial laboratory. Kern Family Foundation, Private, $25,175. (June 6, 2014 - September 1, 2015).

Comfort, D., and S. Gretzinger. Assessment of the state-of-the-art technologies for biosensor manufacturing, AFRL, University of Dayton, $80K. (July 1, 2012 - August 15, 2014).

Comfort, K.K. Development of an enhanced cellular microenvironment for improved evaluation of nanoparticle bioeffects. Dayton Area Graduate Studies Institute, Local, $57,528. (May 2014 - May 2015).

Comfort, K.K. Evaluating the potential of a dual graphene oxide and gold nanorod substrate to promote neuronal adhesion, proliferation, and NGF-dependent differentiation. University of Dayton Research Council, $5K. (May 2014 - August 2014).

Comfort, K.K. Nanophotonic directed neuronal differentiation through the development of a novel 3-dimensional graphene microenvironment. SFFP/ASEE, Federal, $15,600. (May 2014 - August 2014).

Comfort, K.K. Oak Ridge Institute for Science and Education, $6,289. (February 2014 - May 2014).

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Eylon, D. NDE titanium microstructure, THIBRON, Private, $90K. (February 28, 2012 - December 31, 2013).

Eylon, D. NDE titanium KF9, Fraunhofer, Other, $143K. (August 1, 2011 - July 31, 2013).

Eylon, D. NDE titanium KDT, Q-Net, Private, $60K. (June 21, 2011 - July 31, 2013).

Eylon, D. NDE titanium KCP, Fraunhofer, Other, $112K. (April 26, 2011 - April 25, 2013).

Lafdi, K. Integrated fluorescence & scanning probe, NSF, $276K. (February 21, 2013 - February 21, 2017).

Lafdi, K. Novel multifunctional composites, US Navy, $272K. (November 1, 2012 - October 31, 2015).

Lafdi, K. Functionally graded hybrid composites, MURI-AFOSR, $450K. (January 14, 2009 - January 14, 2015).

Lafdi, K. Cytoxic & genotoxic effects of nanoparticles, National Institute of Health, $350K. (October 1, 2011 - October 1, 2014).

Lafdi, K. Composites acid digestion, NCC/Airbus, $11K. (September 25, 2013 - September 24, 2014).

Lafdi, K. Friction of nanocomposites, ZF do Brasil Ltda, $7,500. (September 11, 2013 - September 11, 2014).

Lafdi, K. Fabrication of CNT nanocomposites, NCC/Airbus, $26K. (September 5, 2013 - September 5, 2014).

Lafdi, K. Hybrid fabrics for multifunctional composites, Ohio Dept. of Development, $3M. (July 19, 2010 - July 19, 2014).

Lafdi, K. NTL2 based nanocomposites, NCC/Airbus, $6K. (April 11, 2013 - April 11, 2014).

Lafdi, K. NTL1 based nanocomposites, NCC/Airbus, $5K. (April 1, 2013 - April 1, 2014).

Lafdi, K. Thermo-mechanical properties of polymers, Americhem Inc., $4,500. (September 30, 2013 - March 30, 2014).

Lafdi, K. Fabrication of NTL samples, NCC/Airbus, $14,500. (February 11, 2013 - February 11, 2014).

Lafdi, K. Carbon research, Goodrich Corporation, $10K (February 25, 2013 - December 31, 2013).

Lee, C.W. CHATEM, AFRL / UDRI, Federal, $140K. (2012 - 2016).

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Lee, C.W. (Co-principal). Composite, hybrid and thermally engineered materials. AFRL, Federal. (August 15, 2010 - August 15, 2015).

Sandhu, S. (Principal). Characterization of iron (II) phthalocyanine as the active material for lithium-ion batteries, AFRL, WPAFB, Ohio, Federal. (May 16, 2013 - August 16, 2013).

Wilkens, R.J., and J. Narvaez. Performance of drag reducing agents in heat transfer applications, DAGSI, $150K. (May 2010 - May 2013).

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Bilgin, Ö. 2014. Modeling viscoelastic behavior of polyethylene pipe stresses. *Journal of Materials in Civil Engineering*, ASCE 26, no. 4.

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Bilgin, Ö., et al. 2014. Overview of shells with infill used in geotechnical engineering applications. ISSMGE TC 207 Conference.

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Eustace, D., O. Almuitairi, P.W. Hovey, G. Shoup. 2014. Using decision tree modeling to analyze factors contributing to injury and fatality of run-off-road crashes in Ohio. TRB Annual Meeting Proceedings 93: 19, in Washington, D.C.

Eustace, D., A. Aylo, and W.Y. Mergia. 2013. Effects of left-side merging and diverging ramps on crash frequency on urban freeway segments. 4th International Conference on Road Safety and Simulation (RSS2013), Roma Tre University, October 24, in Rome, Italy.

Eustace, D., S. Ponnada, and S.-Y. Wu. 2013. Identifying locations with high rates of alcohol related traffic crashes in Ohio. 4th International Conference on Road Safety & Simulation (RSS2013), Roma Tre University, October 24, in Rome, Italy.

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Chase, D. V. 2013. Use of genetic algorithms to generate optimal pumping schedules - lessons learned. 9th Cincinnati Area Water Distribution System Seminar, November 18, in Cincinnati, Ohio.

Abdelal, N., and **S.L. Donaldson**. 2013. The effects of voids on delamination behavior under static and cyclic Mode I and Mode II. American Society for Composites 28th Technical Conference, Pennsylvania State University, September 10, in Pennsylvania.

Joshi, N.M., and **S.L. Donaldson**. 2013. Optimization of amount and position of carbon fiber in glass/carbon fiber box beam. Automotive Composites Conference & Exhibition, Society of Plastics Engineers, September 11, in Novi, Michigan.

Eustace, D.. 2013. Safety modeling, session chair. 4th International Conference on Road Safety and Simulation

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Eustace, D., P.W. Hovey, and O. Almutari. 2014. Using Decision Tree Modeling to Analyze Factors Contributing to Injury and Fatality of Run-Off-Road Crashes in Ohio. Transportation Research Board 93rd Annual, U.S. Department of Transportation, January 12, in Washington, D.C.

Hovey, P. W., **D. Eustace**, and V.K. Indupuru. 2013. An analysis of motorcycle fatality risk factors in Ohio. Joint Statistics Meetings, American Statistical Association and other Statistical Societies, August 6, in Montreal, Canada.

CONTRACTS, GRANTS AND SPONSORED RESEARCH

Bilgin, Ö. Analysis of aggregate pier systems for stabilization of subgrade settlement, ODOT, State, $455,636. (October 2012 - October 2016).

Bilgin, Ö. Enhanced models for predicting soil consolidation parameters and settlements, University of Dayton, $6,500. (October 1, 2012 - September 1, 2013).

Chase, D.V. Real-time system optimization for sustainable water transmission and distribution, Great Lakes Protection Fund, Private, $293,745. (September 8, 2008 - Present).

Chase, D.V. Developing water distribution system analysis modules, National Science Foundation, State, $35K. (July 1, 2011 - June 30, 2014).

Crosson, K.M. Efficacy of oxidation treatment for the removal of a bittering agent potentially released to water supplies, Ohio Water Development Authority, State, $113,143. (January 2011 - May 2013).

Hallinan, K.P., M.F. Pinnell, D.G. Taylor, and **K.M. Crosson**. ETHOS sustainable engineering scholars, National Science Foundation, Federal, $650K. (February 2009 - December 31, 2015).

Eustace, D. Developing a GIS-based tool for traffic crash analysis and modeling accident occurrences, Ohio Transportation Consortium (OTC), Federal, $30,054. (October 26, 2011 - September 15, 2013).

Toubia, E. U.S. Navy LCAC PTM Augmentation Project, Nexgen Composites LLC.- U.S. Navy, Federal, $50,760. (January 20, 2014 - March 31, 2015).

Toubia, E. Performance comparison of structural steel coating systems. ODOT, State, $208,817. (October 6, 2014 - February 2016).

Toubia, E. Novel extensible design approaches for advanced aircraft composite structural architectures, Cornerstone Research Group, Local, $27,400. (August 15, 2013 - December 30, 2013).

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Asari, V.K., ed. 2013. *Wide area surveillance: Real time motion detection systems.* Ed. R.I. Hammoud, and L.B. Wolff, vol. 6, 1-400. Berlin: Springer. link.

Chatterjee, M.R. 2014. *Seasons of life: A panoramic selection of songs by Rabindranath Tagore*. Kolkata, West Bengal, India: P.M. Bagchi & Co.

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Santhaseelan, V., and **V.K. Asari**. 2014. Utilizing local phase information to remove rain from video. *International Journal of Computer Vision*, Springer: 1-19.

Zhu, K., C. Li, **V.K. Asari**, and D. Saupe. 2014. No-reference video quality assessment based on artifact measurement and statistical analysis. *IEEE Transactions on Circuits and Systems for Video Technology* 99: 1-9.

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Asari, V.K., and N. Islam. 2013. Guest editorial: Special issue on optical image processing. *Journal of Optics & Laser Technology: Special Issue on Optical Image Processing* 57: 227-229.

Aziz, S.M., M.S. Alam, **V.K. Asari**, A. Hossain, and M.A. Karim. 2013. Guest editorial. *Journal of Computers* 8, no. 5: 1097-1100.

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French, J.C., and **E. Balster**. 2014. A fast and accurate orthorectification algorithm of aerial imagery using integer arithmetic. *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing* 7, no. 5: 1826-1834.

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Aspiras, T., **V.K. Asari**, and J. Vasquez. 2014. Gaussian ringlet intensity distribution GRID features for rotation-invariant object detection in wide area motion imagery. Proceedings of the IEEE International Conference on Image Processing, in Paris, France.

Cui, C., and **V.K. Asari**. 2014. Adaptive weighted local textural features for illumination, expression, and occlusion invariant face recognition. IS&T/SPIE International Conference on Electronic Imaging: Imaging and Multimedia Analytics in a Web and Mobile World 2014, 90270L, in San Francisco, California.

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Arigela, S., and **V.K. Asari**. 2013. Locally tuned inverse sine nonlinear technique for color image enhancement. IS&T/SPIE International Conference on Electronic Imaging: Image Processing: Algorithms and Systems XI, 8655, 865509, 1-15, February 3-7, in San Francisco, California.

Arigela, S., **V.K. Asari,** and M. Qumsiyeh. 2013. Learning multi-level local phase relationship for single image resolution enhancement. IEEE International Conference on Systems, Man and Cybernetics, SMC 2013, 1-6, October 13-16, in Manchester, UK.

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Santhaseelan, V., and **V.K. Asari.** 2013. Whale blow detection in infrared video using fractal analysis as tool for representing dynamic shape variation. IEEE Workshop on the Applications of Computer Vision, 520-525, January 15-27, in Clearwater Beach, Florida.

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Zhu, K., K. Hirakawa, and **V.K. Asari.** 2013. A no-reference video quality assessment based on Laplacian pyramid. Proceedings of the IEEE International Conference on Image Processing, ed. D. Saupe, ICIP 2013: 49-53, September 15-18, in Melbourne, Australia. .

Hytla, P.C., **E. Balster**, J. Vasquez, and R. Neuroth. 2014. Change detection using dual ratio and false color. IEEE Computational Intelligence Society/Symposium Series on Computational Intelligence, in Orlando, Florida.

French, J.C., **E. Balster**, and W.F. Turri. 2013. A fast and accurate orthorectification algorithm of aerial data using. SPIE Remote Sensing, in Dresden.

Whitehead, D.C., **E. Balster**, C.D. McGuinness, and K.L. Hill. 2013. Low complexity method of color image demosaicing directly to YCbCr 4:2:0. European Conference on Visual Media Production CVMP 2013: 18, November 6-7, in London.

Chatterjee, M.R., and T. Algadey. 2014. Realization of negative index in second-order dispersive metamaterials using standard dispersion models for electromagnetic parameters. Proc. SPIE, 9160: 91602I-1-8. Bellingham, Washington.

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Chatterjee, M.R., and T. Algadey. 2013. Investigation of negative index in dispersive, chiral materials via contra-propagating velocities under second-order dispersion GVD. Ed. J.L. Robichaud, SPIE Proceedings, 88370W-1-15 ed., 8837: 15, September 30, in Bellingham, Washington.

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Chatterjee, M.R., and F. Almehmadi. 2013. Nonlinear dynamics of Bragg-domain acousto-optic hybrid feedback for first-order scattering of profiled optical beams. IEEE Photonics Society, Photonics Conference IPC: 376-377, September 8-12, in Bellevue, Washington.

Bricker, S., J.P. Simmons, C. Przybyla, and **R.C. Hardie.** 2014. Anomaly detection of microstructural defects in continuous fiber reinforced composites. SPIE Proceedings, Paper 9401-8, Dec. 2014.

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Hirakawa, K., and K. Barnard. 2014. Fourier spectral filter array design for multispectral image recovery. OSA Imaging and Applied Optics.

Zhang, C., and **K. Hirakawa**. 2014. Blind full reference quality assessment of Poisson image denoising. IEEE International Conference on Image Processing, in Paris, France.

Jin, X., and **K. Hirakawa**. 2013. Approximation to camera sensor noise. Proceedings of SPIE; 8655, Image Processing: Algorithms and Systems XI, 8655OH, February 19.

Zhang, Y., and **K.Hirakawa**. 2013. Blur processing using double discrete wavelet transform. Computer Vision and Pattern Recognition, 2013 IEEE Conference, June 23-28: 1091-1098.

Zhu, K., **K. Hirakawa,** and V.K. Asari. 2013. A no-reference video quality assessment based on Laplacian pyramid. D. Saupe, Proceedings of the IEEE International Conference on Image Processing ICIP 2013: 49-53, September 15-18, in Melbourne, Australia.

Patterson, M.A., M. Qumsiyeh, K.M. Hansen, **G. Subramanyam,** H. Yue., and D. Walker. 2014. Construction of a twin-pier platform for biological sensing. Proceedings/IEEEE NAECON Aerospace and Electronic Conference 2014: 5-9.

Qumsiyeh, M., **G. Subramanyam**, and M.A. Patterson. 2013. A passive RF sensor platform for chemical-biological sensors. Proceedings/IEEE NAECON: IEEE 56th International Midwest Symposium on Circuits and Systems, August 4-7: 967-970.

INVITED LECTURES

Asari, V.K. 2014. Recent advances in wide-area surveillance: What can we see now? Department of Computer Science Graduate Program, University of Texas, November 17, in Dallas, Texas.

Asari, V.K. 2014. Smart facial recognition system. Ohio Innovation Summit, UDRI/IDCAST, October 9, in Dayton, Ohio. Asari, V.K. 2014. Advanced image analysis for automatic object recognition in complex environmental conditions. Ohio Innovation Summit, UDRI/IDCAST, October 8, in Dayton, Ohio.

Asari, V.K. 2014. Automatic object recognition and tracking in complex environmental conditions. National Institute of Technology Karnataka Graduate Program, August 27, in Surathkal, Karnataka, India.

Asari, V.K. 2014. Automatic object recognition and tracking in complex environmental conditions. Manipal Institute of Technology Graduate Program, August 26, in Manipal, India.

Asari, V.K. 2014. Advanced image analysis for automated pipeline threat detection. Pipeline R&D Forum, U.S. Department of Transportation, PHMSA, August 7, in Chicago, Illinois.

Asari, V.K. 2014. Image feature extraction. GrabTV Technology Summit, July 31, in Dayton, Ohio.

Asari, V.K. 2014. Spatiotemporal analysis of EEG signals for human emotion recognition and brain machine interface. IEEE 3rd International Conference and Workshop on Bioinspired Intelligence, IEEE, July 16, in Liberia, Guanacaste, Costa Rica.

Asari, V.K. 2014. Automatic detection and tracking of objects in complex environments.

School of Electrical Engineering Graduate Program, University of Costa Rica, San Pedro Montes de Oca, July 14, in San Jose, Costa Rica.

Asari, V.K. 2014. Learning hierarchical invariant spatio-temporal features for human action and activity recognition. SIAM Workshop Celebrating Diversity: Applications in Human Performance, Society for Industrial and Applied Mathematics (SIAM), July 8, in Chicago, Illinois.

Asari, V.K. 2014. Pipeline right-of-way automated threat detection by advanced image analysis. PRCI Research Exchange Meeting, Pipeline Research Council International (PRCI), February 5, in Atlanta, Georgia.

Asari, V.K. 2013. A nonlinear manifold learning strategy for lighting and orientation invariant pattern recognition. IEEE International Symposium on Computational Intelligence and Informatics, Institute of Electrical and Electronics Engineers, November 19, in Budapest, Hungary.

Asari, V.K. 2013. Automatic pipeline right-of-way threat detection by advanced image analysis. PRCI Research Exchange Meeting, Pipeline Research Council International (PRCI), February 5, in Dallas, Texas.

Subramanyam, G. 2014. Multifunctional oxide thin films for electronics, photonics and sensors. Dushu Lake International Scholars' Forum, Shanghai Normal University, November 1, in Shanghai, China.

Subramanyam, G. 2014. Nondestructive assessment of surface and subsurface defects in wide-bandgap semiconductors using photon back scattering. Workshop on Wideband Gap Electronics, September 23, in College Park, Maryland.

Subramanyam, G. 2014. Multifunctional materials for electronics, photonics and sensors. Seminar: Electrical and Computer Engineering, Villanova University, March 13, in Philadelphia, Pennsylvania.

PRESENTATIONS

Asari, V.K. 2014. Enhancement of hazy color images using a self-tunable transformation function. International Symposium on Visual Computing, ISVC 2014, December 9, in Las Vegas, Nevada.

Asari, V.K. 2014. Gaussian ringlet intensity distribution (GRID) features for rotation-invariant object detection in wide area motion imagery. IEEE International Conference on Image Processing, Institute of Electrical and Electronics Engineers (IEEE), October 28, in Paris, France.

Asari, V.K. 2014. Visibility improvement of shadow regions using hyperspectral band integration. SPIE International Conference on Remote Sensing, Society for Industrial and Applied Mathematics (SIAM), October 25, in Amsterdam, Netherlands.

Asari, V.K. 2014. Efficient hyperspectral image segmentation using geometric active contour formulation. SPIE International Conference on Remote Sensing, Society for Industrial and Applied Mathematics (SIAM), October 24, in Amsterdam, Netherlands.

Asari, V.K. 2014. Study of an EEG based brain machine interface system for controlling a robotic arm. International Conference on Neural Computation Theory and Applications, INSTICC, October 23, Rome, Italy.

Asari, V.K. 2014. Automatic large-volume object region segmentation in LiDAR point clouds. SPIE International Conference on Remote Sensing, Society for Industrial and Applied Mathematics (SIAM), September 23, in Amsterdam, Netherlands.

Asari, V.K. 2014. UD international collaborative program. International Twinning Engineering Program Orientation, International Center for Applied Sciences, Manipal University, August 26, in Manipal, India.

Asari, V.K. 2014. Illumination-invariant pattern recognition using fringe-adjusted joint transform correlator and monogenic signal. International Conference on Electronic Imaging, IS&T and SPIE, February 3, in San Francisco, California.

Asari, V.K. 2014. Optical flow based Kalman filter for body joint prediction and tracking using local binary pattern matching. International Conference on Electronic Imaging, IS&T and SPIE, February 3, in San Francisco, California.

Asari, V.K. 2014. Rotation-invariant histogram features for threat object detection on pipeline right-of-way. International Conference on Electronic Imaging, IS&T and SPIE, February 3, in San Francisco, California.

Chatterjee, M.R., and T. Algadey. 2013. Investigation of negative index in dispersive, chiral materials via contra-propagating velocities under second-order dispersion (GVD). SPIE Annual

Meeting, SPIE, August 17, in San Diego, California.

Chatterjee, M.R., and F. Almehmadi. 2013. Nonlinear dynamics of Bragg-domain acousto-optic hybrid feedback for first-order scattering of profiled optical beams. IEEE Photonics Conference, IEEE, September 5, in Seattle, Washington.

Chatterjee, M.R., and F. Almehmadi. 2013. Numerical examination of acousto-optic Bragg interactions for profiled lightwaves using a transfer function formalism. SPIE Annual Meeting, SPIE, August 15, in San Diego, California.

Sarangan, A.M., and **K. Hirakawa**. 2014. Fourier multispectral imaging. Ohio Innovation Summit, October 7, in Dayton, Ohio.

POSTERS

Asari, V.K. 2014. Detection of machinery threat on pipeline right-of-way. PRCI Research Exchange Meeting, Pipeline Research Council International (PRCI), February 5, in Atlanta, Georgia.

Arigela, S., and **V.K. Asari.** 2013. An automatic visibility improvement and object detection system for wide area surveillance applications. NARP 2013: 2013 National Geospatial-Intelligence Agency (NGA) Academic Research Program (NARP) Symposium and Workshops, National Geospatial-Intelligence Agency (NGA), The National Academy of Sciences Keck Center, September 11, in Washington, D.C.

Arigela, S., and **V.K. Asari**. 2013. Image enhancement and super resolution on RAM aerial imagery. PRCI Research Exchange Meeting, Pipeline Research Council International (PRCI), February 6, Dallas, Texas.

Asari, V.K., D. Bhatt, V. Devabhaktuni, and Y. Diskin. 2013. A novel GPS/INS integration system for localized autonomy in fleets of vehicles. Alliance for Human Effectiveness and Advancement (AHEAD): Autonomy Research Showcase, Alliance for Human Effectiveness and Advancement (AHEAD), December 10, in Dayton, Ohio.

Diskin, Y., and **V.K. Asari**. 2013. 3D change detection and 3D scene mapping. NARP 2013: 2013 National Geospatial-Intelligence Agency (NGA) Academic Research Program (NARP) Symposium and Workshops, National Geospatial-Intelligence Agency (NGA), The National Academy of Sciences Keck Center, September 11, in Washington, D.C.

Diskin, Y., and **V.K. Asari**. 2013. Change detection using 3D scene representation models. PRCI Research Exchange Meeting, Pipeline Research Council International (PRCI), February 6, in Dallas, Texas.

Nair, B., and **V.K. Asari**. 2013. Simultaneous tagging of individuals with unique id and recognition of activities in video surveillance. NARP 2013: 2013 National Geospatial-Intelligence Agency (NGA) Academic Research Program (NARP) Symposium and Workshops, National Geospatial-Intelligence Agency (NGA), The National Academy of Sciences Keck Center, September 11, in Washington, D.C.

Nair, B., and **V.K. Asari**. 2013. Detection of machinery threat on pipeline right of way. PRCI Research Exchange Meeting, Pipeline Research Council International (PRCI), February 6, in Dallas, Texas.

Santhaseelan, V., and **V.K. Asari**. 2013. Extracting context information from aerial imagery. PRCI Research Exchange Meeting, Pipeline Research Council International (PRCI), February 6, in Dallas, Texas.

ABSTRACTS

Asari, V.K., B. Nair, V. Santhaseelan, S. Arigela, Y. Diskin, and A. Mathew. 2013. Automatic pipeline right-of-way threat detection by advanced image analysis. Pipeline Research Council International, in Dallas, Texas.

MAGAZINES/TRADE PUBLICATIONS

Karim, Islam, and **V.K. Asari**. 2013. Optics-based system for robust and reliable encryption. SPIE Newsroom: Defense and Security, May 31. spie.org/x93974.xml B. Nair, V. Santhaseelan, S. Arigela, Y. Diskin, and A. Mathew. 2013. Automatic pipeline right-of-way threat detection by advanced image analysis. Pipeline Research Council International, in Dallas, Texas.

CONTRACTS, GRANTS AND SPONSORED RESEARCH

Asari, V.K. Automatic pipeline threat detection by advanced image analysis, Pipeline Research Council International (PRCI), Private, $175,323.40. (January 1, 2013 - February 28, 2014).

Asari, V.K. Object region segmentation in video, GrabTV (City of Dayton project through

IDCAST), Local, $20K. (June 2013 - December 2013).

Asari, V.K. Localization of human spatial processing using dense-array electroencephalography, Oak Ridge Institute for Science and Education (ORISE), Federal, $40K. (March 2013 - December 2013).

Asari, V.K. Cognitive measures and models for persistent surveillance, 361 Interactive, LLC, Private, $5K. (January 2013 - March 2013).

Asari, V.K., T.D. Skill, S.-Y. Wu, C.E. Browning, and A.M. Sarangan. CC-NIE network infrastructure: Network 10Gb upgrade and science DMZ implementation to support science and engineering research and enhance outreach for high school STEM education, National Science Foundation (NSF), Federal, $232,788. (December 2013 - November 2015).

Asari, V.K. Shadow illumination, haze mitigation and single image super-resolution, AFRL/RH, Federal, $100K. (October 2013 - September 2014).

Asari, V.K. Detection and tracking of moving objects in wide area motion imagery, Air Force Research Laboratory (AFRL), Federal, $325K. (March 16, 2013 - September 30, 2014).

Asari, V.K. Nonlinear image/video enhancement and super-resolution, AFRL, Federal, $300K. (February 2013 - September 2014).

Asari, V.K. Human action and activity recognition by video analysis - Central State University collaborative project, Central State University, State, $22,500. (March 1, 2013 - April 30, 2014).

Asari, V.K. Detection and tracking of moving objects in wide area motion imagery (Under the program SCISSORS), Air Force Research Laboratory (AFRL), Federal, $500K. (May 2012 - August 2013).

Balster, E. Academic layered sensing program (ALSP), project 32, AFRL/RYDI, Federal, $1.8M. (July 1, 2013 - Present).

Balster, E. Research, development, and evaluation of surveillance imaging (R-DESI), AFRL/RYAA, Federal, $900K. (March 1, 2013 - Present).

Balster, E. Academic layered sensing program (ALSP), project 22, AFRL/RYDI, Federal, $621,988. (January 1, 2012 - Present).

Balster, E. CRAMMIT (Comprehensive, robust, adaptive multi-modality image compression technique). U.S. Army, Federal, $15K. (January 15, 2014 - May 1, 2014).

Balster, E. Academic layered sensing program, task 13, research and development of sensor processing systems, AFRL, University of Dayton, $950K. (February 1, 2011 - January 31, 2013).

Pinnell, M.F., R.P. Blust, **E. Balster**, K.E. Bigelow, K.M. Crosson, S.J. Schneider, and K.A. Kinnucan-Welsch. EEC-1009607 - Engineering innovation and design for STEM teachers, NSF, Federal, $499,101. (July 12, 2010 to Present)

Daniels, M.W. LEADER Consortium, National Science Foundation, Federal, $2.4M. (August 2008 - July 2013).

Duncan, B.D. Sub-aperture based EO imaging systems, RNET, Inc., Local, $50K. (October 1, 2008 - Present).

Hardie, R.C. Image restoration for long stand-off range imaging applications. L-3, Local, $69K. (December 15, 2014 - August 15, 2015).

Hardie, R.C. Fiber segmentation and tracking in ceramic matrix composite digital micrographs. WPAFB/AFRL, Local, $50K. (May 15, 2014 - May 15, 2015).

Hardie, R.C. AFRL/WPAFB, $210,411. (2012 - 2014).

Hirakawa, K. Image blur processing, Sony, Private, $79,646. (April 1, 2014 - March 31, 2015).

Hirakawa, K. Low photon count imaging, Sony, Private, $73,765. (April 1, 2013 - March 31, 2014).

Hirakawa, K. Chromatic aberration correction, CISCO, Private, $45K. (June 1, 2012 - May 15, 2013).

Hirakawa, K. Low photon count imaging, Sony, Private, $73,765. (April 1, 2012 - March 31, 2013).

Subramanyam, G. High power agile transmitter/receiver modules. AFOSR, Federal, $150K. (October 1, 2014 - September 30, 2017).

Subramanyam, G. HF excision, MaCauly Brown, Federal, $240K. (April 1, 2012 - December 24, 2014).

Subramanyam, G. High power agile transmitter, AFOSR, Federal, $300K. (March 1, 2012 - September 30, 2014).

Department of Electro-Optics and Photonics

BOOKS

Zhan, Q., ed. 2013. *Vectorial optical fields: Fundamentals and applications*. Singapore: World Scientific.

BOOK CHAPTERS

Vorontsov, M., T. Weyrauch, S. Lachinova, T. Ryan, A. Deck, M. Deck, V. Paramonov, and G. Carhart. 2013. Coherent beam combining and atmospheric compensation with adaptive fiber array systems. In *Coherent laser beam combining,* ed. A. Brignon, 167-191. Weinheim, Germany: Wiley-VCH Verlag GmbH & Co. KGaA.

Zhan, Q. 2014. Vector beams. In *Laser beam propagation: Generation and propagation of customized light*, ed. Andrew Forbes. Boca Raton, Florida: CRC Press, Taylor & Francis Group.

Zhan, Q. 2013. Cylindrical vector beams. In *Vectorial optical fields: Fundamentals and applications,* Q. Zhan, ed. Singapore: World Scientific.

Chen, W., and **Q. Zhan.** 2013. Comprehensive focal field engineering with vectorial optical fields. In *Vectorial optical fields: Fundamentals and applications*, Q. Zhan, ed. Singapore: World Scientific.

Rui, G., and **Q. Zhan**. 2013. Plasmonics with vectorial optical fields. In *Vectorial optical fields: Fundamentals and applications*, Q. Zhan, ed. Singapore: World Scientific.

Zhan, Q. 2013. Optical measurement techniques utilizing vectorial optical fields. In *Vectorial optical fields: Fundamentals and applications*, Q. Zhan, ed. Singapore: World Scientific.

JOURNAL ARTICLES

Aylo, R., G. Nehmetallah, H. Li, and **P.P. Banerjee**. 2014. Multilayer periodic and random metamaterial structures: Analysis and applications. *IEEE Access*, 2: 437-460.

Banerjee, P.P., L. Williams, G. Nehmetallah, and S. Praharaj. 2014. Holographic volume displacement calculations via multi-wavelength digital holography. *Applied Optics* 53: 1597-1603.

Banerjee, P.P., D. Evans, W. Lee, V. Reshetnyak, and N. Tansu. 2013. Hybrid organic–inorganic materials for novel photonic applications. *Applied Optics* 52: HM1-HM3.

Banerjee, P.P., D. Evans, W. Lee, V. Reshetnyak, and N. Tansu. 2013. Hybrid organic–inorganic materials for photonic applications. *Optics Materials Express* 3: 1149-1151.

Liebig, C., S. Buller, **P.P. Banerjee**, S. Basun, P. Blanche, J. Thomas, C. Christensen, N. Peyghambarian, and D. Evans. 2013. Achieving enhanced gain in photorefractive polymers by eliminating electron contributions using large bias fields. *Optics Express* 21: 30392-30400.

Williams, L., G. Nehmetallah, and **P.P. Banerjee**. 2013. Digital tomographic compressive holographic reconstruction of three-dimensional objects in transmissive and reflective geometries. *Applied Optics* 52: 1702-1710.

Belardini, A., M. Centini, G. Leahu, E. Fazio, C. Sibilia, **J.W. Haus**, and A.M. Sarangan. 2014. FD 178: Second harmonic generation on self-assembled tilted gold nanowires. *The Royal Society of Chemistry* (November 10).

Haus, J.W., D. de Ceglia, M.A. Vincenti, and M. Scalora. 2014. Nonlinear quantum tunneling effects in nano-plasmonic environments. *Journal of the Optical Society of America B* 31, no. 6: A13-A19.

Haus, J.W., D. de Ceglia, M.A. Vincenti, and M. Scalora. 2014. Quantum conductivity for metal-insulator-metal nanostructures. *Journal of the Optical Society of America B* 31, no. 2: 259-269.

Scalora, M., D. de Ceglia, M.A. Vincenti, and **J.W.Haus**. 2014. Nonlocal and quantum tunneling contributions to harmonic generation in nanostructures: Electron cloud screening effects. *Physical Review A* 90: 013831-8.

Wang, L., P.E. Powers, A.M. Sarangan, and **J.W. Haus**. 2014. Image revivals in multi-mode optical fibers with periodic multiple sub-apertures. *Optical Communications* 326: 57-63.

de Ceglia, D., M.A. Vincenti, S. Campione, F. Capolino, **J.W. Haus**, and M. Scalora. 2014. Second harmonic double resonance cones in dispersive hyperbolic metamaterials. *Physical Review B* 89: 075123 February 19.

Dapore, B., D.P. Rabb, and **J.W. Haus**. 2013. Phase noise analysis of two wavelength coherent imaging system. *Optics Express* 21, no. 25: 30642.

Scalora, M., M.A. Vincenti, D. de Ceglia, M. Grande, and **J.W. Haus**. 2013. Spontaneous and stimulated Raman scattering near metal nanostructures in the ultrafast, high-intensity regime. *Journal of the Optical Society of*

America B 30, no. 10: 2634-2639.

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INVITED LECTURES

Banerjee, P.P. 2014. Recent advances in digital holography. Penn State Colloquium, Penn State, November, in State College, Pennsylvania.

Banerjee, P.P. 2014. Noninterferometric method to determine induced space charge field in photorefractives using transport of intensity. 12th Photorefractive Program Review, AFRL Materials, June, in Key Largo, Florida.

Banerjee, P.P., and J. Haus. 2014. EO at UD. U. Wisconsin, February, in Platteville, Wisconsin.

Haus, J.W. 2014. Nanofabrication technology. Lasers and Photonics India, OSA, September 24, in Bangalore, India.

Haus, J.W. 2014. How low can you go? Quantum tunneling in nanoplasmonic materials. STARS Symposium, University of Dayton, September 18, in Dayton, Ohio.

Haus, J.W. 2014. Exposing quantum effects in nanoplasmonics or How low can you go? CReO, OSA/SPIE student chapter, September 4, in Ensenada, Mexico.

Haus, J.W. 2014. Electronic tunneling effects in nanoplasmonic structures. PIERS Conference, PIERS, August 27, in Guangzhou, China.

Haus, J.W. 2014. Optics Workshop. INAOE, May 4, in Puebla, Mexico.

Haus, J.W. 2014. Quantum tunneling in nanoplasmonic systems. ECE Seminar, University of Alabama at Huntsville, January 10, in Huntsville, Alabama.

Haus, J.W. 2013. Quantum conductivity theory for nanoplasmonic systems. OSA Incubator on Structured Light in Structured Materials, Optical Society of America, October 1, in Washington, D.C.

Haus, J.W. 2013. Quantum conductivity and metal-insulator-metal nanoparticles. Seminar, University Roma-La Sapienza, July 4, in Rome, Italy.

Haus, J.W. 2013. Nanophotonic systems: Linear and nonlinear properties. International Conference on Nanophotonics / Advances in Optoelectronics and Micro / Nano Optics, May 20, in Hong Kong, China.

Haus, J.W. 2013. Nonlinear optics: Potential U.S.-Czech/Slovak collaborations. National Science Foundation, April 19, in Prague, Czech Republic.

Haus, J.W. 2013. Nonlinear optics in nanophotonic systems. SPIE Optics and Photonics, SPIE, April 17, in Prague, Czech Republic.

Haus, J.W. 2013. Optical fibers for lasers and sensing applications. Seminar, Miami University, March 20, in Oxford, Ohio.

Haus, J.W. 2013. Specialty optical fibers for lasers and sensing applications. Seminar, U.S. Army Aviation and Missile Command, February 27, in Huntsville, Alabama.

Haus, J.W., L. Li, N. Katte, C. Deng, M. Scalora, D. de Ceglia, and M.A. Vincenti. 2013. Nanowire metal-insulator-metal plasmonic devices. ICPS 2013: International Conference on Photonics Solutions, SPIE, May 26, in Pattaya, Thailand.

Vorontsov, M., and **E.E. Polnau**. 2014. Deep turbulence effects mitigation with advanced cascaded adaptive optics technics: Analysis and experimental evaluation. NATO ET-87 Technical Exchange Meeting on Atmospheric Optics Effects, NATO, November 5, in Dayton, Ohio.

Vorontsov, M., and **E.E. Polnau.** 2014. Advanced cascaded adaptive optics technique for deep turbulence effects mitigation: Analysis and experimental results. AFOSR MURI Annual Review Meeting, University of Dayton Research Institute, July 23, in Dayton, Ohio.

Vorontsov, M., T. Weyrauch, V. Ovchinnikov, and **E.E. Polnau**. 2014. Atmospheric turbulence compensation and coherent beam combining over a 7 km propagation path using a fiber-array system with 21 sub-apertures. OSA Annual Imaging and Applied Optics Congress, The Optical Society, July 16, in Seattle, Washington.

Sarangan, A.M. 2013. Microchips that make pictures: Nano-technology and image sensors. University of Dayton STARS Symposium, September 15, in Dayton, Ohio.

Sarangan, A.M. 2013. Nanostructured thin films using oblique angle deposition: Synthesis, optical properties and applications. University of Rochester Institute of Optics, University of Rochester, February 14, in Rochester, New York.

Vorontsov, M. 2014. Analysis of optical turbulence and refractive effects on laser beam and image propagation. AFRL MURI Technical Exchange & STTR Review Meeting, AFRL, Kihei, December 17, in Maui, Hawaii.

Vorontsov, M. 2014. Development of a high-power adaptive phased fiber-array laser system. Briefing for Dr. Eyad Abed (NSF), NSF, November 25, in Arlington, Virginia.

Vorontsov, M. 2014. Scalable adaptive fiber-array elements (SAFARE). Meeting with DARPA, November 25, in Arlington, Virginia.

Vorontsov, M. 2014. AFOSR deep turbulence MURI. AFOSR Annual Review Meeting 2014, USAF, November 18, in Kirtland AFB, New Mexico.

Vorontsov, M. 2014. Overview of the AFOSR deep turbulence MURI research. NATO ET-87 Technical Exchange Meeting on Atmospheric Optics Effects, NATO, November 4, in Dayton, Ohio.

Vorontsov, M. 2014. Wave optics of deep atmospheric turbulence: From underlying physics towards predictive modeling, mitigation and exploitation. Meeting with Dr. Charles L. Matson, AFOSR, University of Dayton Research Institute, October 30, in Dayton, Ohio.

Vorontsov, M. 2014. Fiber-arrays: A coming revolution in the way we build optical systems. 7th Annual Ohio Innovation Sensor Summit, University of Dayton Research Institute, October 9, in Dayton, Ohio.

Vorontsov, M. 2014. Brightness function numerical simulation technique in analysis of active and passive atmospheric imaging systems. AFRL Sensors Directorate, hosted by Dr. LeMaster, AFRL, August 14, in Dayton, Ohio.

Vorontsov, M. 2014. Performance comparison between locally phased fiber-array and Cassegrain beam director in vacuum. DARPA MTO Meeting, DARPA, July 30, in Arlington, Virginia.

Vorontsov, M. 2014. Wave optics of deep atmospheric turbulence: From underlying physics towards predictive modeling, mitigation & exploitation. NATO SET Panel, NATO, May 14, in Chatillon, France.

Vorontsov, M.., T. Weyrauch, and D. Bricker. 2014. Deep turbulence & speckle effects in coherently combined fiber-array systems: Analysis and experimental demonstrations directed. Energy Systems Symposium, Directed Energy Professional Society, August 27, in Monterey, California.

Vorontsov, M., M. Aubailly, S. Lachinova, and M. Maynard. 2014. Predictive analysis of atmospheric optics systems with GPU-based WONAT software. NATO ET-87 Technical Exchange Meeting on Atmospheric Optics Effects, NATO, November 5, in Dayton, Ohio.

Vorontsov, M., and S. Babu. 2014. Adaptive phased fiber-array laser source for material joining & addictive manufacturing via spatial and temporal control of energy flux. Meeting with DARPA, January 2, in Washington, D.C.

Vorontsov, M., G. Filimonov, S. Lachinova, and V. Kolosov. 2014. Comparative analysis of Monte-Carlo and brightness function approaches in numerical simulations of incoherent imaging systems in deep turbulence. AFOSR MURI Annual Review Meeting, University of Dayton Research Institute, July 23, in Dayton, Ohio.

Vorontsov, M., G. Filimonov, and V. Ovchinnikov. 2014. Comparative analysis of laser beam projection efficiency in volume turbulence with fiber-array and conventional beam director systems. NATO ET-87 Technical Exchange Meeting on Atmospheric Optics Effects, NATO, November 5, in Dayton, Ohio.

Vorontsov, M., V. Kulikov, and G. Filimonov. 2014. Impact of coupled turbulence and refraction effects on laser beam propagation in atmosphere. NATO ET-87 Technical Exchange Meeting on Atmospheric Optics Effects, NATO, November 5, in Dayton, Ohio.

Vorontsov, M., V. Kulikov, Z. Yang, and D. Bricker. 2014. Optical waves propagation in atmosphere with strong variation of refractive index gradients: Toward fusion of ray tracing and wave optics techniques. AFOSR MURI Annual Review Meeting, University of Dayton Research Institute, July 23, in Dayton, Ohio.

Vorontsov, M., and S. Lachinova. 2014. Target-in-the-loop atmospheric turbulence characterization based on remote

sensing invariants. OSA Annual Imaging and Applied Optics Congress, The Optical Society, July 16, in Seattle, Washington.

Vorontsov, M., and S. Lachinova. Target-in-the-loop atmospheric turbulence characterization based on remote sensing invariants. Third International Workshop on Advanced Threat Warning, Tracking and Laser Countermeasures in Atmospheric Turbulence (WARTRACK 2014), Air Force Office of Scientific Research and Fraunhofer IOSB, Germany, June 25, in Ettlingen, Germany.

Vorontsov, M., S. Lachinova, M. Aubailly, and B. Bordbar. 2014. Novel wavefront sensing techniques for operation in strong scintillation conditions. NATO ET-87 Technical Exchange Meeting on Atmospheric Optics Effects, NATO, November 5, in Dayton, Ohio.

Vorontsov, M., S. Lachinova, M. Aubailly, and M. Maynard. 2014. GPU-based wave-optics numerical analysis toolbox (WONAT) for predictive simulation of atmospheric optical systems. Technology Exchange Meeting on Maritime Horizontal Path Turbulence Modeling, Testing and Prediction, US Navy, February 27, in San Diego, California.

Vorontsov, M., S. Lachinova, and V. Kolosov. 2014. Brightness function theoretical framework for numerical analysis of passive long-range imaging systems. AFOSR MURI Annual Review Meeting, University of Dayton Research Institute, July 23, in Dayton, Ohio.

Vorontsov, M., S. Lachinova, and T. Weyrauch. 2014. Complex field atmospheric sensing suite for deep turbulence research. NATO SET Panel, NATO, May 14, in Chatillon, France.

Vorontsov, M., T. Weyrauch, and D. Bricker. 2014. Deep turbulence & speckle effects in coherently combined fiber-array systems: Analysis and experimental demonstrations. Directed Energy Systems Symposium, Directed Energy Professional Society, August 27, in Monterey, California.

Vorontsov, M., T. Weyrauch, D. Bricker, and G. Filimonov. 2014. Experimental analysis of speckle-field propagation in atmosphere with implication to beam quality remote evaluation and adaptive optics. NATO ET-87 Technical Exchange Meeting on Atmospheric Optics Effects, NATO, November 5, in Dayton, Ohio.

Vorontsov, M., T. Weyrauch, G. Filimonov, and D. Bricker. 2014. Deep turbulence and speckle effects mitigation in coherently combined fiber-array systems. AFOSR MURI Annual Review Meeting, University of Dayton Research Institute, July 23, in Dayton, Ohio.

Vorontsov, M., T. Weyrauch, S. Lachinova, and D. Bricker. 2014. Intelligent beam control for optical phased arrays transceivers AFRL STTR Phase 2. Presentation to Dr. Dan Marker, AFRL, University of Dayton Research Institute, June 19, in Dayton, Ohio.

Vorontsov, M., T. Weyrauch, V. Ovchinnikov, and G. Wu. 2014. Deep turbulence effects compensation with adaptive fiber-array systems. Third International Workshop on Advanced Threat Warning, Tracking and Laser Countermeasures in Atmospheric Turbulence (WARTRACK 2014), Air Force Office of Scientific Research and Fraunhofer IOSB, June 25, in Ettlingen, Germany.

Vorontsov, M., T. Weyrauch, V. Ovchinnikov, and G. Wu. 2014. Experimental demonstration of phase locking of a 21-subaperture fiber-collimator array over a 7-km atmospheric propagation path. Third International Workshop on Advanced Threat Warning, Tracking and Laser Countermeasures in Atmospheric Turbulence (WARTRACK 2014), Air Force Office of Scientific Research and Fraunhofer IOSB, June 25, in Ettlingen, Germany.

Vorontsov, M., T. Weyrauch, V. Ovchinnikov, and G. Wu. 2014. Experimental demonstration of phase locking of a 21-subaperture fiber-collimator array over a 7-km atmospheric propagation path. SPIE Defense, Security & Sensing Expo 2014, SPIE, May 7, in Baltimore, Maryland.

Vorontsov, M., Z. Yang, V. Kulikov, and G. Filimonov. 2014. Incoherent imaging in presence of atmospheric turbulence and refraction effects. NATO ET-87 Technical Exchange Meeting on Atmospheric Optics Effects, NATO, November 5, in Dayton, Ohio.

Zhan, Q. 2013. Beaming and steering of photons with spin and orbital angular momentum using spiral plasmonic antenna. SPIE Optics+Photonics, SPIE, August, in San Diego, California.

Zhan, Q. 2013. Tailoring optical complex fields with nanostructured metallic thin film. SPIE Optics+Photonics, SPIE, August, in San Diego, California.

PRESENTATIONS

Banerjee, P.P. 2014. Time dynamics of self-pumped reflection gratings in a photorefractive polymer. U. of Dayton, November, in Dayton,

Ohio.

Li, H., A.M. Sarangan, and **P.P. Banerjee**. 2014. Nano-scale patterns of molybdenum on glass substrate for use in super-resolution imaging with metamaterials. SPIE Optics and Photonics, SPIE, September 10, in San Diego, California.

Liebig, C., S. Buller, **P.P. Banerjee**, S. Basun, P. Blanche, J. Thomas, and N. Peyghambarian. 2014. Gain enhancement in photorefractive polymers. APS March Meeting, American Physical Society, April.

Chatterjee, M.R., and T. Algadey. 2013. Investigation of negative index in dispersive, chiral materials via contra-propagating velocities under second-order dispersion (GVD). SPIE Annual Meeting, SPIE, August 17, in San Diego, California.

Chatterjee, M.R., and F. Almehmadi. 2013. Nonlinear dynamics of Bragg-domain acousto-optic hybrid feedback for first-order scattering of profiled optical beams. IEEE Photonics Conference, IEEE, September 5, in Seattle, Washington.

Chatterjee, M.R., and F. Almehmadi. 2013. Numerical examination of acousto-optic Bragg interactions for profiled lightwaves using a transfer function formalism. SPIE Annual Meeting, SPIE, August 15, in San Diego, California.

Haus, J.W. 2014. Atmospheric systems, nonlinear optics and nanophotons. Outreach trip, University of Wisconsin Platteville, March 11, in Platteville, Wisconsin.

Haus, J.W. 2014. Efficient harmonic generation in double-near-zero-permittivity slabs. SPIE Photonics West, SPIE, February 19, in San Francisco, California.

Haus, J.W., B. Dapore, and D.P. Rabb. 2013. Phase noise of two wavelength coherent imaging system as function of spatial frequency content. Coherent Laser Radar Conference, June 19, in Barcelona, Spain.

Fox, B., **A.M. Sarangan**, P. Shah, and J. Moradmand. 2014. Growth of nano-spiral films using glancing angle deposition. 10th Annual Dayton Engineering Sciences Symposium (DESS 2014), October 28, in Dayton, Ohio.

Ni, C., P. Shah, and **A.M. Sarangan**. 2014. Effects of different wetting layers on the growth of smooth ultra-thin silver thin films. SPIE Optics and Photonics, SPIE, September 5, in San Diego, California.

Reeder, N., J. Moradmand, and **A.M. Sarangan.** 2014. Virtual nanofab: A silicon nanofabrication trainer. 4th Annual Micro Nano Tech Conference, National Science Foundation, June, in Albuquerque, New Mexico.

Sarangan, A.M. 2014. Silicon quantum walls: Fabrication, infrared properties and application to detectors. AFRL, August 11, in Dayton, Ohio.

Wang, J., and **A.M. Sarangan**. 2014. Nanoimprint fabrication of wiregrids micro-polarizers in near infrared spectra using SU-8 as an intermediate film. SPIE Optics and Photonics, SPIE, August 28, in San Diego, California.

Sarangan, A.M. 2013. Nanostructured surfaces for chem/bio sensing applications. Ohio Innovation Summit, June 25, in Dayton, Ohio.

Sarangan, A.M., J. Moradmand, and J.J. Joo. 2013. MEMS displacement-amplifying compliant mechanism fabricated using SU-8. 9thAnnual Dayton Engineering Sciences Symposium (DESS 2013), ASME, October 29, in Dayton, Ohio.

Sarangan, A.M., P. Shah, and C. Ni. 2013. Effects of different wetting layers on the growth of smooth ultra-thin silver thin films. 9thAnnual Dayton Engineering Sciences Symposium (DESS 2013), ASME, October 29, in Dayton, Ohio.

Vorontsov, M. 2014. Performance comparison of conventional and fiber-array beam director systems over tactical range distances. Technology Exchange Meeting on Maritime Horizontal Path Turbulence Modeling, Testing and Prediction, in San Diego, California.

Vorontsov, M. 2014. Scintillation resistant multi-aperture phase-contrast wavefront sensor. SPIE Photonics West Conference, in San Francisco, California.

Vorontsov, M., and S. Lachinova, S. 2014. GPU-based wave-optics numerical analysis toolbox WONAT for predictive simulation of atmospheric optical systems. Technology Exchange Meeting on Maritime Horizontal Path Turbulence Modeling, Testing and Prediction, in San Diego, California.

Vorontsov, M., and T. Weyrauch. 2014. Experimental demonstration of phase locking of a 21-subaperture fiber-collimator array over a 7-km atmospheric propagation path. SPIE Defense, Security, and Sensing Conference, in Baltimore, Maryland.

Vorontsov, M. 2013. Update on deep turbulence effects compensation and coherent beam combining over a 7-km propagation path. 2013 MURI Technical Exchange Meeting, AFOSR, November 7, in Miami,

Florida.

Vorontsov, M. 2013. Optical phased array in deep turbulence conditions: Analysis & atmospheric evaluation. DARPA/ AFRL Technical Exchange Meeting, DARPA, October 16, in Albuquerque, New Mexico.

Vorontsov, M. 2013. Adaptive fiber-array systems for coherent beam combining and atmospheric compensation. 2013 Directed Energy Systems Symposium, DEPS, August 28, in Monterey, California.

Vorontsov, M. 2013. Turbulence enhanced cooperative optical communications concept and analysis. 2013 Directed Energy Systems Symposium, DEPS, August 27, in Monterey, California.

Vorontsov, M. 2013. Optical phased arrays. Overview Of Fiber Array Technology Development In Optical Phased Arrays & Fiber Beam Combining Technical Exchange Meeting, DARPA, June 28, in Washington, D.C.

Vorontsov, M. 2013. Conservation laws for counter-propagating optical waves in atmospheric turbulence with application to directed energy & laser communications. Imaging and Applied Optics / Propagation through and Characterization of Distributed Volume Turbulence, OSA, June 26, in Arlington, Virginia.

Vorontsov, M. 2013. Overview of fiber array technology developments. Review Meeting, ARL, June 14, in Washington, D.C.

Vorontsov, M. 2013. Advanced material processing with adaptive phased fiber-array laser systems. Briefing for Admiral Carr, May 21, in Washington, D.C.

Vorontsov, M. 2013. Overview of technology developments for high energy laser weapon applications. Briefing for Admiral Carr, May 21, in Washington, D.C.

Vorontsov, M., and S. Babu. 2013. Material joining via spatial and temporal control of energy flux with adaptive phased fiber-array laser systems. DARPA, May 7, in Washington, D.C.

Vorontsov, M., V.S.R. Gudimetla, A. Vorontsov, and P. Paramonov. 2013. Large-scale turbulence effects analysis and piston phase retrieval problem. 2013 MURI Annual Review, AFOSR, June 27, in Arlington, Virginia.

Vorontsov, M., T. Tumolillo, J. Raker, S. Lachinova, S. John, S. Sahib, G. Wu, and T. Weyrauch. 2013. Scalable adaptive fiber-array elements (SAFARE). DARPA, June 28, in Washington, D.C.

Vorontsov, M., T. Weyrauch, S. Lachinova, V. Ovchinnifov, G. Wu, J. Raker, M. Maynard, and G. Filimonov. 2013. Coherent beam combining & atmospheric compensation with low-power excalibur fiber-array. Technical Exchange Meeting, MIT Lincoln Labs, September 10, Boston, Massachusetts.

Vorontsov, M., T. Weyrauch, T. Tumolillo, S. Lachinova, S. John, S. Sahib, G. Wu, T.P. Ryan, and V. Ovchinnikov. 2013. Review of Fiber-Array Technology Programs, Dan Marker, September 24, in Dayton, Ohio.

Zhan, Q., and S. Wang. 2013. Modified bow-tie antenna with strong broadband field enhancement for RF photonic applications. SPIE Optics + Photonics, SPIE, August, in San Diego, California.

PAPERS PUBLISHED IN CONFERENCE PROCEEDINGS

Abeywickrema, U., and **P.P. Banerjee**. 2014. Phase-shifting holography using Bragg and non-Bragg orders in photorefractive lithium niobate. Proc. SPIE. 92000Z: 8.

Alam, M., J. Khoury, **P.P. Banerjee**, W. Durant, D. Martin, and G. Nehmetallah. 2014. Performance evaluation of optimal filters for target detection using SAR imagery. Proc. SPIE. 90940C: 8.

Banerjee, P.P. 2014. Recent advances in digital holography. OSA Int'l Conf. Fiber Optics and Photonics: 3.

Banerjee, P.P., J. Khoury, M. Alam, G. Nehmetallah, W. Durrant, D. Martin, N. Peyghambarian, and M. Yamamoto. 2014. Performance comparison of photorefractive two-beam coupling correlator with optimal filter based correlators. Proc. SPIE.909405: 12.

Banerjee, P.P., H. Liu, and L. Williams. 2014. Experimental evaluation of digital holographic reconstruction using compressive sensing. Proc. SPIE. 90060Y: 8.

Li, H., A. Sarangan, G. Rui, J. Hu, and **P.P. Banerjee**. 2014. Nano-scale patterns of molybdenum on glass substrate for use in super-resolution imaging with metamaterials. Proc. SPIE. 91631D: 6.

Memerzadeh, S., G. Nehmetallah, and **P.P. Banerjee**. 2014. Noninterferometric tomographic reconstruction of 3D static and dynamic phase and amplitude objects. Proc. SPIE. 91170M: 8.

Nehmetallah, G., **P.P. Banerjee**, J. Khoury, and M. Alam. 2014. Performance evaluation of photorefractive two-beam coupling joint transform correlator. Proc. SPIE. 909409: 10.

Williams, L., **P.P. Banerjee**, G.

Nehmetallah, and S. Praharaj. 2014. Volume displacement measurement via multi-wavelength digital holographic surface topography at the microscopic level. Proc. SPIE. 90060K: 7.

Williams, L., G. Nehmetallah, R. Aylo, and **P.P. Banerjee**. 2014. Near-field Fresnel reconstruction of digital holograms. Digital Holography: Opt. Soc. Amer: 3.

Aylo, R., **P.P. Banerjee**, S. Basun, and D. Evans. 2013. Contribution of diffusion and photovoltaic effect to self-pumped reflection gratings in photorefractive lithium niobate. Proceedings of SPIE 8847: 88470B.

Banerjee, P.P., and U. Abeywickrema. 2013. A simple optical probing technique for nonlinearly induced refractive index. Proceedings of SPIE 8847: 88471O.

Banerjee, P.P., U. Abeywickrema, G. Nehmetallah, S. Lyuksyutov, and N. Kukhtarev. 2013. Applications of Bragg and non-Bragg orders in holography and interferometry. Proceedings of SPIE 8883: 888307.

Banerjee, P.P., G. Nehmetallah, U. Abeywickrema, S. Lyuksyutov, and N. Kukhtarev. 2013. Non-Bragg diffraction orders in holographic recording and its application to one-shot phase-shifting holographic interferometry. Proceedings in SPIE 8644: 864402.

Liebig, C., S. Basun, S. Buller, D. Evans, **P.P. Banerjee**, P. Blanche, C. Christensen, N. Peyghambarian. 2013. Enhanced gain dynamics in photorefractive polymers. Proceedings of SPIE 8847: 88470A.

King, B.J., I. Idehenre, P.E. Powers, **J.W. Haus**, K.M. Hansen. 2014. Biosensing platform with tapered optical microfibers: new results. Society of Photographic Instrumentation Engineers SPIE 8933: 893303-7, in Bellingham Washington.

Haus, J.W., D. de Ceglia, M.A. Vincenti, and M. Scalora. 2014. A quantum tunneling theory for nanophotonics. Proc. SPIE 8994: 89941Q-10, in Bellingham Washington.

Vincenti, M.A., D. de Ceglia, **J.W. Haus**, and M. Scalora. 2014. Efficient harmonic generation in double-near-zero-permittivity slabs. Proceedings of SPIE 8994: 89941U, in Bellingham Washington.

Haus, J.W., L. Li, N. Katte, C. Deng, M. Scalora, D. de Ceglia, and M.A. Vincenti. 2013. Nanowire metal-insulator-metal plasmonic devices. SPIE ICPS 2013: International Conference on Photonics Solutions 8883: 14.

Haus, J.W., L. Wang, P.E. Powers, and A.M. Sarangan. 2013. Coherent super-position of multiple beams in a large mode area fiber. SPIE Micro-structured and Specialty Optical Fibers 8775: 8.

Sarangan, A.M., **J.W. Haus**, S. Jain, J. Moradmand, and N. Reeder. 2013. Collaborative classroom tools for nanotechnology process education. ASEE Annual Conference Proceedings, June 23-26, in Atlanta, Georgia.

Vorontsov, M., T. Weyrauch, V. Ovchinnikov, **E.E. Polnau**, G. Wu, T. Ryan, and M. Maynard. 2014. Current status and challenges in optical turbulence simulations in various layers of the Earth's atmosphere. Imaging and Applied Optics 2014, OSA Technical Digest PW2E.3.

Derenko, S., R. Wuchrer, **A.M. Sarangan**, C. Schuster, and T. Härtling, T. 2013. Surface plasmon resonance gradients in gold nanoparticle arrays for multispectral applications. Proc. SPIE 8693, Smart Sensor Phenomena, Technology, Networks, and Systems Integration.

Haus, J.W., L. Wang, P.E. Powers, and **A.M. Sarangan**. 2013. Coherent super-position of multiple beams in a large mode area fiber. SPIE Micro-structured and Specialty Optical Fibres 8775: 8.

Sarangan, A.M., J.W. Haus, S. Jain, J. Moradmand, and N. Reeder. 2013. Collaborative classroom tools for nanotechnology process education. ASEE Annual Conference Proceedings, June 23-26, in Atlanta, Georgia.

Vorontsov, M. 2014. Deep turbulence effects compensation with adaptive fiber-array systems. Ettlingen: Third International Workshop on Advanced Threat Warning, Tracking and Laser Countermeasures in Atmospheric Turbulence.

Vorontsov, M., S. Basu, C.G. Nunalee, and S.T. Fiorino. 2014. Reconstructing the prevailing meteorological and optical environment during the time of the Titanic disaster. Proc. SPIE 9224: 92240Y.

Vorontsov, M., G. Filimonov, and S. Lachinova. 2014. Performance analysis of a coherent tiled fiber-array beam director with near-field phase locking and programmable control of tip/tilt and piston phases. SPIE 8971: 897109.

Vorontsov, M., and S. Lachinova. 2014. Target-in-the-loop atmospheric turbulence characterization based on remote sensing invariants. Imaging and Applied Optics 2014, OSA Technical Digest PW2E, 1 ed.

Vorontsov, M., C.G. Nunalee, P. He, S. Basu, and S.T. Fiorino. 2014. Impact of large-scale atmospheric refractive structures

on optical wave propagation. SPIE 9224: 92240W.

Vorontsov, M., T. Weyrauch, V. Ovchinnikov, E.E. Polnau, G. Wu, T. Ryan, and M. Maynard. 2014. Current Status and challenges in optical turbulence simulations in various layers of the Earth's atmosphere. Imaging and Applied Optics 2014, OSA Technical Digest PW2E.3.

Aubailly, M., and **M. Vorontsov**. 2013. Digital adaptive optics and imaging through deep turbulence. Proceedings of SPIE 8610: 86100Y.

Minet, J., **M. Vorontsov**, G. Wu, and D. Dolfi. 2013. Efficiency comparisons of spatial and spectral diversity techniques for fading mitigation in free-space optical communications over tactical-range distances. Proceedings of SPIE 8610: 86100X.

Zhan, Q., J. Fu, L. Zhou, M. Lim, M. Goleb, and H. Daniel Ou-yang. 2013. Mapping two-dimension trapping potential of nanoparticles in an optical trap. SPIE proceedings 8883: 88830J, in Seattle Washington.

Zhan, Q., and S. Wang. 2013. Modified bow-tie antenna with strong broadband field enhancement for RF photonic applications. SPIE proceedings 8806: 88061V, in Seattle Washington.

Zhan, Q., S. Wang, X. Zhang, A. Hosseini, X. Xu, Y. Zhou, S. Chakravarty, and R.T. Chen. 2013. Electric field sensor based on electro-optic polymer refilled silicon slot photonic crystal waveguide coupled with bowtie antenna. SPIE proceedings 8624: 862418, in Seattle, Washington.

PAPERS

King, B.J., I. Idehenre, P.E. Powers, **J.W. Haus**, and K.M. Hansen. 2014. Biosensing platform with tapered optical microfibers: New results. SPIE Annual Meeting, Society of Photographic Instrumentation Engineers (SPIE), February 1, in San Francisco, California.

King, B.J., I. Idehenre, P.E. Powers, **J.W. Haus**, and K.M. Hansen. 2013. Tapered optical fibers for biosensing applications. Electrochemical Society Fall 2013 Meeting, Electrochemical Society, October 29, in San Francisco, California.

King, B.J., I. Idehenre, P.E. Powers, **J.W. Haus**, and K.M. Hansen. 2013. Tapered optical fibers for aqueous phase biosensing applications. ONNA: Optical Nanofiber Applications: From Quantum to Bio Technologies, ONNA Workshop, June 1, in Okinawa, Japan.

King, B., I. Igehenre, **J.W. Haus**, P.E. Powers, and K.M. Hansen. 2013. Tapered optical fibers for aqueous and gaseous phase biosensing applications. Society of Photographic Instrumentation Engineers (SPIE) Annual Meeting, February 2, in San Francisco, California.

ABSTRACTS

King, B. J., I. Idehenre, P.E. Powers, **J.W. Haus**, and K.M. Hansen. 2014. Biosensing platform with tapered optical microfibers: New results. Society of Photographic Instrumentation Engineers SPIE, in Bellingham, Washington.

King, B., I. Idehenre, **J.W. Haus**, P.E. Powers, and K.M. Hansen. 2013. Tapered optical fibers for aqueous and gaseous phase biosensing applications. Society of Photographic Instrumentation Engineers SPIE, in Bellingham, Washington.

King, B.J., I. Idehenre, P.E. Powers, **J.W. Haus**, and K.M. Hansen. 2013. Tapered optical fibers for aqueous phase biosensing applications. Optical Nanofiber Applications: From Quantum to Bio Technologies, in Okinawa, Japan.

King, B.J., I. Idehenre, P.E. Powers, A.M. Sarangan, **J.W. Haus**, and K.M. Hansen. 2013. Tapered optical fibers for biosensing applications. Electrochemical Society, in Pennington, New Jersey.

King, B.J., I. Idehenre, P.E. Powers, **A.M. Sarangan**, J.W. Haus, and K.M. Hansen. 2013. Tapered optical fibers for biosensing applications. Electrochemical Society, in Pennington, New Jersey.

WORKSHOPS

Vorontsov, M., and S. Lachinova. 2014. Target-in-the-loop atmospheric turbulence characterization based on remote sensing invariants. Third International Workshop on Advanced Threat Warning, Tracking and Laser Countermeasures in Atmospheric Turbulence, June 24-26, in Ettlingen, Germany.

Vorontsov, M., and S. Lachinova. 2013. Atmospheric turbulence: Physics characterization, application and limits of compensation techniques. DARPA Workshop on Laser Beam Propagation through Atmospheric Turbulence, DARPA, September 12, in Washington, D.C.

CONTRACTS, GRANTS AND SPONSORED RESEARCH

Banerjee, P.P. Waveguide-based devices. AFRL/SSS, $41K.

(August 2014 - August 2015).

Banerjee, P.P. Study of dynamic optical materials (2). AFRL/ Azimuth, $31,650. (January 2014 - July 2015).

Banerjee, P.P. Spatial aperture synthesis, AFRL/SAIC, Federal, $55K. (August 2013 - July 2015).

Banerjee, P.P. Study of dynamic optical materials, AFRL/ Azimuth, Federal, $212K. (June 2013 - July 2015).

Banerjee, P.P. SBIR phase II-E subcontract: Spectral imaging sensor testing, applied optimization. $60K. (June 2014 - June 2015).

Banerjee, P.P. Optoelectronic image processing, AFRL, Federal, $120K. (November 2012 - April 2014).

Banerjee, P.P., and G. Nehmetallah. High speed surface measurement device Phase II, Army/DMS, Federal, $320K (March 1, 2011 - July 31, 2013).

Haus, J.W. Variable acuity hemispherical threat detection for remotely operated weapons systems. UtopiaCompression, Private, $160K. (September 1, 2014 - September 30, 2016).

Haus, J.W. Sense and avoid Ladar for remotely piloted aircraft. UtopiaCompression, Private, $85K. (February 1, 2014).

Haus, J.W. Quantum nanoplasmonics, National Research Council, Private, $108K. (April 1, 2013 - March 30, 2014).

Haus, J.W. Pan camera project, UtopiaCompression, Private, $90K. (June 7, 2011 - October 1, 2013).

Haus, J.W. A novel video-based adaptive intelligent hemispherical threat detection system, UtopiaCompression, Private, $30K. (January 1, 2013 - June 1, 2013).

Powers, P.E., and **J.W. Haus**. Support for SAIC ALTAR program, SAIC (Subcontract to AFRL), Federal, $67,646. (August 30, 2012 - August 31, 2013).

Sarangan, A.M., and **J.W. Haus**. Inorganic electrochromic glass R&D, CSG Holding Co, Private, $175K. (October 2012 - September 2013).

Haus, J.W. Sense and avoid ladar for unmanned aircraft systems (UAS), Utopia Compression (AFRL Phase II), Private, $90. (January 19, 2011 - October 19, 2013).

Sarangan, A.M., **J.W. Haus**, and J.G. Weber. Collaborative research: Cross-institutional nano-technology education and workforce training project, National Science Foundation, Federal, $99,995. (January 1, 2012 - December 31, 2013).

Sarangan, A.M. Interferometric lithography and substrate patterning/epitaxy for nonlinear quasi-phase-matched device development. Air Force Research Laboratory, Federal, $368,505. (March 1, 2014 - September 2016).

Sarangan, A.M. Anti-reflection coating, UES, Private, $20K. (January 29, 2014 - November 15, 2015).

Sarangan, A.M. CC-NIE network infrastructure: Network 10Gb upgrade and science DMZ implementation to support science and engineering research and enhance outreach for high school STEM education. National Science Foundation, award #1340932, $232,788. (December 2013 – November 2015).

Sarangan, A.M. CCSS: Spectral filter array for multispectral imaging. National Science Foundation, award #1307904, $319,952. (September 2013 – August 2016).

Sarangan, A.M. Collaborative research: Cross-institutional nano-technology education and workforce training project. National Science Foundation, award #1138165, $100K. (January 2012 – December 2014).

Sarangan, A.M. Diffusion furnace, AFRL, Federal, $15K. (2014).

Sarangan, A.M. Ion source for thin film deposition. AFRL, Federal, $20K. (2014).

Sarangan, A.M. Identification of compromised electronic components. RNet, Private, $40K. (October 2014 - June 2015).

Sarangan, A.M. Investigation of the infrared optical properties of silicon nanowires. AFRL, Federal. (May 15, 2014 - September 30, 2014).

Sarangan, A.M. Electrochromic glass research and development. China Southern Glass Holding Co. Ltd, $175K. (October 2012 – September 2013).

Sarangan, A.M. Infrared coatings for laser effects on materials, structures and sensors, AFRL (through UES), Federal, $9K. (January 22, 2013 - December 31, 2013).

Sarangan, A.M. Ohio academic research cluster for layered sensing, Ohio Third Frontier Project, State, $24,348,718. (August 18, 2008 - November 18, 2013).

Sarangan, A.M. Development of metal vapor coating & blue enhanced medical imaging, FMI Medical Imaging, $30,800. (September 1, 2012 - April 30, 2013).

Subramanyam, G., and **A.M. Sarangan**. BioSense, AFRL Sensors Directorate & IDCAST, Federal, $385,312, Funded.

(October 1, 2010 - December 31, 2013).

Vorontsov, M. FA95501210449, US Air Force, Federal, $1,639,778. (September 15, 2012 - September 14, 2017).

Vorontsov, M. Sandia, Federal, $10K. (December 23, 2013 - September 30, 2014).

Vorontsov, M. Cooperative Agreement #W911NF-09-02-0040, ARL, Federal, $1,416,975. (September 9, 2009 - September 8, 2013).

Vorontsov, M. 120293BM, THALES Research and Technology, Private, $130K. (March 1, 2012 - February 28, 2013).

Vorontsov, M., and T. Weyrauch. AGRMT DTD 12182012, MV Innovative Technologies, Private, $216,012. (September 24, 2012 - June 30, 2014).

Vorontsov, M., and T. Weyrauch. AGRMT DTD 04252013, MV Innovative Technologies, Private, $45K. (February 6, 2013 - October 4, 2013).

Zhan, Q. Metamaterials: Conformal roadmap, AFRL, Federal, $550K. (April 1, 2012 - October 31, 2014).

Zhan, Q. Numerical modeling of acoustic and optical phenomena for the development of nondestructive evaluation sensors, IZFP, Private, $180K. (January 14, 2013 - May 31, 2014).

Zhan, Q. Modeling, fabrication and characterization of thermal metamaterials, AFRL, Federal, $200K. (October 1, 2011 - October 31, 2013).

Department of Engineering Management, Systems and Technology

BOOKS

Mott, R.L., and **J. Untener.** 2014. *Applied fluid mechanics*. 7th ed. New Jersey: Prentice Hall, Inc.

BOOK REVIEWS

Globig, J., ed. 2013. Contemporary electronics: Fundamentals, devices, circuits and systems. New York: McGraw-Hill.

JOURNAL ARTICLES

Pinnell, M.F., J. Rowley, S. Preiss, S. Franco, **R.P. Blust**, and R. Beach. 2013. Bridging the gap between engineering design and PK-12 curriculum development through the use of STEM education quality framework. *Journal of STEM Education* 14, no. 4: 29-35.

INVITED LECTURES

Segalewitz, S.I. 2014. Flipping a first-year computer programming class. Flipped-Classroom Reading Group, UD e-Learning, February 26, in Dayton, Ohio.

Segalewitz, S.I. 2013. Opportunities for faculty and departments at the University of Dayton China Institute. UD Chairs Collaborative, October 7, in Dayton, Ohio.

PAPERS PUBLISHED AT CONFERENCE PROCEEDINGS

Pinnell, M.F., S. Franco, S. Preiss, **R.P. Blust,** and R. Beach. 2013. Engaging K-12 teachers in engineering innovation and design: Lessons learned from a pilot NSF research experience for teachers program. ASEE Annual Conference and Exposition and ASEE North Central Section Conference.

Pinnell, M.F., S. Franco, S. Preiss, **R.P. Blust,** J. Rowley, and R. Beach. 2013. Innovating education for the next generation of engineers - results of an NSF-RET program focused on innovation. 2013 ASEE Annual International Conference and Exposition.

Sugarman, R., K. Schneider, and **E. Mykytka**. 2014. Development of a Systems Engineering Course for Multiple Delivery Methods. Proceedings of the 2014 ASEE Annual Conference, asee.org, in Indianapolis, Indiana.

Sugarman, R., **K. Schneider**, and E. Mykytka, E. 2014. Development of a systems engineering course for multiple delivery methods. Proceedings of the 2014 ASEE Annual Conference, asee.org, in Indianapolis, Indiana.

Zalewski, D., and **K. Schneider**. 2014. Introducing mastery level on-line assessments in a blended graduate course. Proceedings of the Industrial Engineering Research Conference, in Montreal, Quebec, Canada.

Segalewitz, S.I. 2013. Seven years of success in implementation of a 3 + 1 transfer program in engineering technology between universities in China and the Unites States. ASEE Annual Conference, in Atlanta, Georgia.

Zalewski, D., and K. Schneider.

2014. Introducing mastery level on-line assessments in a blended graduate course. Proceedings of the Industrial Engineering Research Conference, in Montreal, Quebec, Canada.

PRESENTATION

Pinnell, M.F., S. Franco, S. Preiss, **R.P. Blust**, J. Rowley, and R. Beach. 2013. Innovating education for the next generation of engineers: Results of an NSF-RET program focused on innovation. 2013 ASEE Annual Conference and Exposition, ASEE, June 23, in Atlanta, Georgia.

Pinnell, M.F., S. Franco, S. Preiss, **R.P. Blust,** and R. Beach. 2013. Engaging K-12 teachers in engineering innovation and design: Lessons learned from a pilot NSF research experience for teachers program. 2013 ASEE Annual Conference and Exposition, ASEE, June 24, in Atlanta, Georgia.

Edmonson, C.P. 2014. Writing for professional publications. ASEE Conference on Industry and Education Collaboration (CIEC), American Society for Engineering Education, February 5, in Savannah, Georgia.

Schneider, K. 2013. From industrial engineering student to practicing industrial engineer. 2013 Knovel Virtual Conference, Knovel, October 15.

Schneider, K., C.E. Rainwater, and E.A. Pohl. 2013. Multi-state social network analysis under conditional influence with limited resources. Industrial and Systems Research Conference, Institute of Industrial Engineers, May, in San Juan, Puerto Rico.

Schneider, S.J. 2014. The UD—SHNU partnership. Shanghai Normal Prospective Student Recruitment, Shanghai Normal University, November 5, in Shanghai, China.

Segalewitz, S.I. 2014. So you want to flip your classroom? UD E-Learning Innovations Day, May 14, in Dayton, Ohio.

Segalewitz, S.I. 2014. Developing and implementing a flipped classroom. UD Faculty Exchange Series (FES), University of Dayton, March 30, in Dayton, Ohio.

Segalewitz, S.I. 2014. Developing industry partnerships in China. ASEE Conference on Industry and Education Collaboration (CIEC), American Society for Engineering Education, February 5, in Savannah, Georgia.

Segalewitz, S.I. 2014. Why communication is necessary for students: A conversation with non-communication scholars. Basic Course Director, National Communication Association, University of Dayton, January 24, in Dayton, Ohio.

Segalewitz, S.I. 2013. Opportunities for faculty at the University of Dayton China Institute. UD Faculty Exchange Series, September 25, in Dayton, Ohio.

Segalewitz, S.I. 2013. Seven years of success in implementation of a 3 + 1 transfer program in engineering technology between universities in China and the Unites States. ASEE Annual Conference, American Society for Engineering Education, June 25, in Atlanta, Georgia.

Segalewitz, S.I. 2013. Planning for a year-round experience at UDCI. UD Provost Council, May 6, in Dayton, Ohio.

Segalewitz, S.I. 2013. Applied electronic circuits. UD Explore Engineering, UD Kettering Labs, February 23, in Dayton, Ohio.

Segalewitz, S.I. 2013. Recruiting for UDCI 13SU program. University of Dayton China Institute, eight presentations at XXX-200 classes, January, in Dayton, Ohio.

Segalewitz, S.I. 2013. UDCI Overview. University of Dayton China Institute, UD Sears Auditorium, January 14 and 16, in Dayton, Ohio.

NEWSLETTER

Deep, Ronald. 2014. *MPULSE*. Monthly column for the Dayton area Mensa complex.

Deep, Ronald. 2013. *MPULSE*. Monthly column for the Dayton area Mensa complex.

CONTRACTS, GRANTS AND SPONSORED RESEARCH

Blust, R. Ohio means internships and co-ops. State of Ohio, University of Dayton, $690K. (January 2014 - June 2016).

Blust, R.P. Innovation Center Industry Projects, Industry Sponsors, Local, $200K. (August 2014 - May 2015).

Blust, R.P. HHDN - Helping Hands Dense Network, Kern Family Foundation, Private, $1,195,000. (November 2011 - December 2014).

Blust, R.P. Promoting women through LEADER (Launching equity in the academy across the Dayton entrepreneurial region, National Science Foundation, Local, $2,860,000. (September 2008 - August 2013).

Doty, J. Advanced mathematical techniques for new systems-level analysis & optimization, Air Force Office of Scientific Research (AFOSR), Federal, $600K. (October 1, 2010 - September 30, 2013).

Edmonson, C.P. Simio Software, Simio LLC, Private, $79,200. (July 7, 2011 - Present).

Falkowski, S.A. National Center for Manufacturing Education, National Science Foundation, Other, $1.6M. (April 2011 - Present).

Segalewitz, S.I. Piloting the use of tablets in the STEM classroom, Glennon Family Foundation, Private, $15K. (October 2013 - Present).

Untener, J. Everyday examples in engineering, National Science Foundation, $2K. (March 2013 - December 2013).

Department of Mechanical and Aerospace Engineering

PROFESSIONAL ENGINEERING SEMINARS

Kissock, J.K. 2014. Energy efficient manufacturing. University of Dayton China Institute, October 25-27, in Suzhou, China.

Kissock, J.K. 2014. Energy efficient compressed air systems/process cooling. Triple Point Energy, March 7, in Columbus, Ohio.

Kissock, J.K. 2013. Energy efficient compressed air and process cooling. Triple Point Energy, July 9 and November 8, in Columbus, Ohio.

Kissock, J.K. 2013. Energy efficient manufacturing. University of Dayton China Institute, October 13-15, in Suzhou, China.

JOURNAL ARTICLES

Geyman, Matthew, **Aaron Altman**, and Greg Parker. 2014. Wing/wall aerodynamic interactions in free flying, maneuvering MAVS. *International Journal of Micro Air Vehicles* 6, no. 2.

Hammer, Patrick, **Aaron Altman**, Franklin Eastep. 2014. A discrete vortex method application to attached and separated low Reynolds number unsteady flows. *AIAA Journal* 52, no. 3: 643-649.

Kang, Hantae, Nicola Genco, and **Aaron Altman**. 2013. Empirically derived biplane lift as a function of gap and stagger. *Journal of Aircraft* 50, no. 1: 292-298 (January).

Bigelow, K.E., and K. Jackson. 2014. The immediate influence of carbon composite ankle foot orthoses on balance and gait in individuals with peripheral neuropathy: A pilot study. *Journal of Prosthetics and Orthotics* 264: 220-227.

Reinert, S.S., K. Jackson, and **K.E. Bigelow**. 2014. Using posturography methods to examine the immediate effects of a vestibular swing therapy session on children with Autism Spectrum Disorders: A feasibility study. *Physical and Occupational Therapy in Pediatrics* (November 6).

Jackson, K., and **K.E. Bigelow**. 2013. Measures of balance performance are affected by a rested versus fatigued testing condition in people with multiple sclerosis. *Physical Medicine and Rehabilitation* 5, no. 11: 949-956.

Choi, J.-K., and V. Fthenakis. 2014. Crystalline silicon photovoltaic recycling planning: Macro and micro perspectives. *Journal of Cleaner Production* 66: 443-449.

Choi, J.-K., A. Morrison, K.P. Hallinan, and R.J. Brecha. 2014. Economic and environmental impacts of community-based residential building energy efficiency investment. *Energy*.

Ramanujan, D., W. Berstein, **J.-K. Choi**, M. Koho, F. Zhao, K. Ramani. 2014. Prioritizing design for environment strategies using a stochastic multi criteria decision analysis. *ASME Journal of Mechanical Design*.

Choi, J.-K. 2013. End-of-life management of c-Si photovoltaic module. *Journal of the Korean Science and Engineering Association* 41, no. 3: 31-32.

Choi, J.-K., and V. Fthenakis. 2013. Crystalline silicon photovoltaic recycling planning: Macro and micro perspectives. *Journal of Cleaner Production* 66: 443-449.

Ramani, K., D. Ramanujan, W. Berstein, **J.-K. Choi**, M. Koho, and F. Zhao. 2013. Prioritizing design for environment strategies using a stochastic multi criteria decision analysis. *ASME Journal of Mechanical Design*.

Johnson, D.J., **J.S. Ervin**, M.S. Hanchak, S. Patnaik, and X. Hu. 2014. The use of graphite foam and pentaglycerine for solid-state thermal energy storage. *Journal of Thermophysics and Heat Transfer* 75.

Michalak, T., S.M. Emo, **J.S. Ervin**, and T. Reitz. 2014. Control strategy for aircraft vapor compression system operation. *International Journal of Refrigeration/Elsevier* 48: 10-18.

Hanchak, M.S., M.D. Vangsness, L.W. Byrd, and **J.S. Ervin**. 2014. Thin film evaporation of n-octane on silicon: Experiments and theory. *International Journal of Heat and Mass Transfer* 75: 196-206.

Hanchak, M.S., A.M. Briones, **J.S. Ervin**, L.W. Byrd, and S. Putnam. 2013. One-dimensional models of nanoliter droplet evaporation from a hot surface in the transition regime. *International Journal of Heat and Mass Transfer*.

Hanchak, M.S., M.D. Vangsness, L.W. Byrd, **J.S. Ervin**, and J.G. Jones. 2013. Profile measurements of thin liquid films using reflectometry. *Applied Physics Letters* 103: 211607.

Jiang, H., **J.S. Ervin**, S.S. Zabarnick, and Z. West. 2013. Studies of turbulent flow, heat transfer deterioration and thermal oxidation of jet fuel under conditions of high heat flux and flow velocity. *AIAA J. Thermophysics and Heat Transfer* 27: 668-678.

Choi, J.-K., A. Morrison, **K.P. Hallinan**, and R.J. Brecha. 2014. Economic and environmental impacts of community-based residential building energy efficiency investment. *Energy*.

Roman, V.-S., B. Phil, **K.P. Hallinan**, and R.J. Brecha. 2014. Cost-availability curves for hierarchical implementation of residential energy-efficiency measures. *J. of Energy Efficiency*: 1-14.

Dooley, S., **J.S. Heyne,** S.H. Won, P. Dievart, Y. Ju, and F.L. Dryer. 2014. Importance of a cycloalkane functionality in the oxidation of a real fuel. *Energy & Fuels*. doi: 10.1021/ef5008962

Sudholt, A., L. Cai, **J. Heyne,** F.M. Haas, H. Pitsch, and F.L. Dryer. 2014. Ignition characteristics of a bio-derived class of saturated and unsaturated furans for engine applications. Proc. Comb. Institute. doi: 10.1016/j.proci.2014.06.147

Dryer, F. L., S. Jahangirian, S. Dooley, S.H. Won, **J.S. Heyne,** V.R. Iyer, T.A. Litzinger, and R. Santoro. 2014. Emulating the combustion behavior of real jet aviation fuels by surrogate mixtures of hydrocarbon fluid blends: Implications for science and engineering. *Energy & Fuels.* doi: 10.1021/ef500284x

Kashani, A.R. 2014. Tuned damping of balcony vibration. *ASCE Journal of Performance of Construction Facilities*.

Pohlman, D., A. Qayyum, S. Parker, and **K. Kissock**. 2014. Staging packaged air conditioning units to improve energy efficiency and humidity control by reducing cycling losses. *ASHRAE Transactions*, SE-14-004.

Mohammed, A.Q., T. Wenning, F. Sever, and **K. Kissock**. 2013. Energy efficient operation of ammonia refrigeration systems. *ASHRAE Transactions*, DE-13-019.

Kissock, K., A. Selvacanabady, and N. Raghavan. 2013. Simplified model for ground heat transfer from slab-on-grade buildings. *ASHRAE Transactions*, DE-13-041.

Myszka, D.H., J. Lauden, P. Joyce, and **A.P. Murray**. 2014. Development of a spring-based automotive starter. *SAE International Journal of Commercial Vehicles* 71: 286-294.

Myszka, D.H., **A.P. Murray**, and C.W. Wampler. 2014. Computing the branches, singularity trace, and critical points of single degree-of-freedom, closed-loop linkages. *Journal of Mechanisms and Robotics* 61.

Shamsudin, S.A., and **A.P. Murray**. 2013. A closed-form solution for the similarity transformation parameters of two planar point sets. *Journal of Mechanical Engineering and Technology* 5, no. 1: 59-68.

Shamsudin, S.A., **A.P. Murray**, D.H. Myszka, and J.P. Schmiedeler. 2013. Kinematic synthesis of planar, shape-changing, rigid mechanisms for design profiles with significant differences in arc length. *Machine and Mechanism Theory* 70, no.12: 425-440.

Myszka, D.H., J. Lauden, P. Joyce, and A.P. Murray. 2014. Development of a spring-based automotive starter. *SAE International Journal of Commercial Vehicles* 71: 286-294.

Myszka, D.H., A.P. Murray, and C.W. Wampler. 2014. Computing the branches, singularity trace, and critical points of single degree-of-freedom, closed-loop linkages. *Journal of Mechanisms and Robotics* 61.

Shamsudin, S.A., A.P. Murray, **D.H. Myszka,** and J.P. Schmiedeler. 2013. Kinematic synthesis of planar, shape-changing, rigid mechanisms for design profiles with significant differences in arc length. *Machine and Mechanism Theory* 70, no. 12 (September 6): 425-440.

Pinnell, M.F., M. Daniels, K. Hallinan, and G. Berkemeier. 2014. Leveraging students' passion and creativity: ETHOS at the University of Dayton. *International Journal for Service Learning in Engineering, Special Edition* (Fall): 180-190.

Pinnell, M.F., J. Rowley, S. Preiss, S. Franco, R.P. Blust, and R. Beach. 2013. Bridging the gap between engineering design and PK-12 curriculum development through the use the STEM education quality framework. *Journal of STEM Education* 14, no. 4: 29-35.

Eldredge, J., I. Senocak, P. Dawson, J. Canino, W. Liou, R. LeBeau, **M. Rumpfkeil**, and R. Cummings. 2014. A best practices report on CFD education in the undergraduate curriculum. *International Journal of Aerodynamics* 43, no. 4: 200-236.

Narvaez, J.A., H. Thornburg, **M. Rumpfkeil**, R.J. Wilkens. 2014. Computational modeling of a microchannel cold plate: Pressure, velocity, and temperature profiles. International *Journal of Heat and Mass Transfer* 78: 90-98.

Rumpfkeil, M. 2013. Robust design under mixed aleatory/epistemic uncertainties using

gradients and surrogates. *Journal of Uncertainty Analysis and Applications* 1, no. 7. doi:10.1186/2195-5468-1-7.

Rumpfkeil, M. 2013. Optimizations under uncertainty using gradients, Hessians, and surrogate models. *AIAA Journal* 51, no. 2: 444-451.

INVITED LECTURES

Altman, Aaron. 2014. Determining wing performance from measurements in the turbulent self-preserved wake. University of Maryland, Department of Aerospace Engineering, November, in College Park, Maryland.

Choi, J.-K., and V. Fthenakis. 2014. Photovoltaic recycling planning: Macro and micro perspectives. International Energy Agency PVPS Task 12, September 23, in Amsterdam, Netherlands.

Choi, J.-K. 2013. Integrated policy-energy-economy-environment-engineering (PE4) analysis. Renewable Energy Center Seminar, POSTECH, June 28, in Pohang, Korea.

Choi, J.-K. 2013. Integrated sustainable systems design. UD freshman seminar, Department of Mechanical and Aerospace Engineering, University of Dayton, April 5, in Dayton, Ohio.

Hallinan, K.P. 2014. Climate resilience economic opportunity in Dayton. Dayton Salem Avenue Peace Corridor, September 17, in Dayton, Ohio.

Hallinan, K.P. 2014. University of Dayton energy activities. Green Energy Ohio Conference, March 14, in Dayton Ohio.

Kissock, J.K. 2014. Investing and energy audits: A common approach. Ohio Advanced Energy Economy Conference, November 6, in Columbus, Ohio.

Kissock, J.K. 2014. Energy efficient process cooling. Ohio Energy Management Conference, February 28, in Columbus, Ohio.

Kissock, J.K. 2013. Integrated systems plus principles approach to industrial energy efficiency. Honda Supplier Network, November 13, in Columbus, Ohio.

Kissock, J.K. 2013. Identifying and tracking building energy efficiency opportunities across your campus. Big Ten and Friends Mechanical and Energy Conference, October 1, in Columbus, Ohio.

Kissock, J.K. 2013. Portfolio energy management. Rocky Mountain Institute, June 24, in Boulder, Colorado.

Kissock, J.K. 2013. Guiding energy efficiency with inverse modeling. Energy Management Congress West, Association of Energy Engineers, June 19, in Las Vegas, Nevada.

Kissock, J.K. 2013. Integrated systems plus principles approach to industrial energy efficiency. Association of Energy Engineers, June 13, in Columbus, Ohio.

Kissock, J.K. 2013. Energy efficient HVAC in manufacturing plants. Ohio Energy Management Conference, February 19, in Columbus, Ohio.

Murray, A.P. 2014. Accurately locating and tracking the center of mass in humanoids and humans. Universita di Roma, Spaienza, Universita di Roma, December 9, in Rome, Italy.

Murray, A.P. 2014. Statically equivalent serial chain modeling. Invited Lecture, M.S. Electrical Engineering course, Robotics: Modeling and Control, University Montpellier 2, March, in Montpellier, France.

Murray, A.P. Everything I know about teaching. New Faculty Orientation, University of Dayton, August 16, in Dayton, Ohio.

Petrykowski, J.C. 2013. Nucleate boiling corrections applied to severe accident safety experiments. Oak Ridge National Laboratory, December 10, in Oak Ridge, Tennessee.

Petrykowski, J.C. 2013. Electromagnetic processing of liquids. Oak Ridge National Laboratory, December 9, in Oak Ridge, Tennessee.

Rumpfkeil, M. 2014. The power of adjoints for optimizations and uncertainty quantifications. Adjoint and CFD Solver Technology Workshop, Rolls-Royce Corporation, November 13, in Indianapolis, Indiana.

Rumpfkeil, M. 2014. The power of derivatives for optimization and uncertainty quantification. Engineering Seminar Series, Wright State University, February 28, in Dayton, Ohio.

Rumpfkeil, M. 2013. Surrogate models, uncertainty quantification, and optimization under uncertainty research seminar. University of British Columbia, August 7, in Vancouver, Canada.

PAPERS PUBLISHED AT CONFERENCE PROCEEDINGS

Wabick, K., M. Memon, **A. Altman**, and R. Buffo. 2014. Wingtip vortices from an exergy-based perspective. 52nd AIAA Aerospace Sciences Meeting and Exhibit, AIAA 14-0955, January, in National Harbor, Maryland.

Gunasekaran, S., and **A. Altman**. 2014. Wing performance insight from the self-preserved turbulent

wake. 52nd AIAA Aerospace Sciences Meeting and Exhibit, AIAA 14-0247, January, in National Harbor, Maryland.

Lego, Z., and **A. Altman**. 2013. Analysis of a variable camber wing during highly unsteady maneuvers. 31st Applied Aerodynamics Conference, AIAA 13- 3053, June, in San Diego, California.

Altman, A., and S. Gunasekaran. 2013. Identification of aircraft by their unique turbulent wake signature: Progress with experimental validation. 51st AIAA Aerospace Sciences Meeting and Exhibit, AIAA 13- 1120, January, in Grapevine, Texas.

Choi, J.-K., J.K. Kissock, and K.P. Hallinan. 2013. Beyond industrial energy assessments: The life cycle design perspective. ACEEE Summer Study on Energy Efficiency in Industry, 4-1 to 4-11, in Niagara Falls, New York.

Emo, S.M., **J.S. Ervin**, T. Michalak, and V. Tsao. 2014. Cycle-based vapor cycle system control and active charge management for dynamic airborne applications. SAE Aerospace Systems and Technology Conference, in Warrendale, Pennsylvania.

Alshatshati, S., **K.P. Hallinan**, and R.J. Brecha. 2014. Community scale prediction of Building R-value and mass density from single point in time thermal images. ACEEE Summer Study on Energy Efficiency in Buildings, 2014th ed., in Pacific Grove, California.

Raziei, A., **K.P. Hallinan**, and R.J. Brecha. 2014. Energy cost optimization for system with both solar energy and conventional energy production and energy storage, and real time pricing. IEEE- Innovative Smart Grid Technologies 2014, in Washington, D.C.

Choi, J.-K., J.K. Kissock, and **K.P. Hallinan**. 2013. Beyond industrial energy assessments: The life cycle design perspective. ACEEE Summer Study on Energy Efficiency in Industry, 4-1 to 4-11, in Niagara Falls, New York.

Schubert, T., and **K.P. Hallinan**. 2013. Improving the efficiency of Stirling engines for use in distributed electricity, heating, and cooling. ASME 7th International Conference on Energy Sustainability, ESFuelCell2013-18093, in Minneapolis, Minnesota.

Mazdeh, A., and **A.R. Kashani**. 2014. The impacts of bias flow and geometric variables on acoustic damping attributes of perforated liners. ASME Congress, in Montreal, Canada.

Choi, J., and **K. Kissock**. 2013. Beyond industrial energy assessments: The life cycle design perspective. ACEEE Summer Study on Energy in Industry, July 23-26, in Niagara Falls, New York.

Raffio, T., B. Abels, H. Zhang, and **K. Kissock**. 2013. Integrated systems plus principles approach and energy efficiency guidebook. ACEEE Summer Study on Energy in Industry, July 23-26, in Niagara Falls, New York.

Pohlman, D., J. Smith, J. Bu, and **K. Kissock**. 2013. Net-zero carbon manufacturing at net-zero cost. ACEEE Summer Study on Energy in Industry, July 23-26, in Niagara Falls, New York.

Mohammed, A.Q., T. Wenning, F. Sever, and **K. Kissock**. 2013. Energy efficient design retrofit and control of evaporative condensers in ammonia refrigeration systems. ACEEE Summer Study on Energy in Industry, July 23-26, in Niagara Falls, New York.

Nagabhairava, M., Y. Ma, and **K. Kissock.** 2013. Economic analysis of solar PV and batteries for common residential electricity rate structures using green button data. ES-FuelCell2013-18248, ASME 7th International Conference on Energy Sustainability, July 14-19, in Minneapolis, Minnesota.

Winter, B., L. Louco, **K. Kissock**, P. Mariadass, and M. Daniels. 2013. Design and construction of a solar thermal refrigeration system for Patna, India. ES-FuelCell2013-18243, ASME 7th International Conference on Energy Sustainability, July 14-19, in Minneapolis, Minnesota.

Giaier, K., **A.P. Murray**, and D.H. Myszka. 2014. Serial chains of spherical four-bar mechanisms to achieve design helices. International Design Engineering Conference, in Buffalo, New York.

Giaier, K., D.H. Myszka, W. Kramer, and **A.P. Murray**. 2014. Variable geometry dies for polymer extrusion. ASME International Mechanical Engineering Congress and Exhibition, in Montreal, Canada.

Li, B., **A.P. Murray**, and D.H. Myszka. 2014. Improving techniques in statically equivalent serial chain modeling for center of mass estimation. International Design Engineering Conference, in Buffalo, New York.

Myszka, D.H., C. Guan, **A.P. Murray**, and T. Hodapp. 2014. A semi-empirical prediction model for the discharge line temperature of hermetic compressors. International Compressor Engineering Conference, in West Lafayette, Indiana.

Myszka, D.H., J. Lauden, P. Joyce, and **A.P. Murray**. 2014.

Development of a spring-based automotive starter. SAE World Congress.

Nieman, J., **A.P. Murray**, and D.H. Myszka. 2014. A novel, elastically-based, regenerative brake and launch mechanism. International Design Engineering Conference, in Buffalo, New York.

Li, B., **A.P. Murray**, and D.H. Myszka. 2013. Improving techniques for center of mass estimation using statically equivalent serial chain modeling. 24th Canadian Congress of Applied Mechanics, in Saskatoon, Saskatchewan.

Lin, L., D.H. Myszka, and **A.P. Murray**. 2013. Using the singularity trace to understand linkage motion characteristics. International Design Engineering Conference, in Portland, Oregon.

Tong, Y., D.H. Myszka, and **A.P. Murray**. 2013. Four-bar linkage synthesis for a combination of motion and path-point generation. International Design Engineering Conference, in Portland, Oregon.

Giaier, K., A.P. Murray, and **D.H. Myszka**. 2014. Serial chains of spherical four-bar mechanisms to achieve design helices. International Design Engineering Conference, in Buffalo, New York.

Giaier, K., **D.H. Myszka**, W. Kramer, and A.P. Murray. 2014. Variable geometry dies for polymer extrusion. ASME International Mechanical Engineering Congress and Exhibition, in Montreal, Canada.

Li, B., A.P. Murray, and **D.H. Myszka**. 2014. Improving techniques in statically equivalent serial chain modeling for center of mass estimation. International Design Engineering Conference, in Buffalo, New York.

Myszka, D.H., C. Guan, A.P. Murray, and T. Hodapp. 2014. A semi-empirical prediction model for the discharge line temperature of hermetic compressors. International Compressor Engineering Conference, in West Lafayette, Indiana.

Myszka, D.H., J. Lauden, P. Joyce, A.P. Murray. 2014. Development of a spring-based automotive starter. SAE World Congress.

Nieman, J., A.P. Murray, and **D.H. Myszka**. 2014. A novel, elastically-based, regenerative brake and launch mechanism. International Design Engineering Conference, in Buffalo, New York.

Li, B., A.P. Murray, and **D.H. Myszka**. 2013. Improving techniques for center of mass estimation using statically equivalent serial chain modeling. 24th Canadian Congress of Applied Mechanics, in Saskatoon, Saskatchewan.

Lin, L., **D.H. Myszka**, and A.P. Murray. 2013. Using the singularity trace to understand linkage motion characteristics. International Design Engineering Conference, in Portland, Oregon.

Tong, Y., **D.H. Myszka**, and A.P. Murray. 2013. Four-bar linkage synthesis for a combination of motion and path-point generation. International Design Engineering Conference, in Portland, Oregon.

Petrykowski, J.C., and Y. Shi. 2013. Analysis of the effectiveness of electromagnetic acoustic transduction in containerless processing operations. 2013 International Mechanical Engineering Conference and Exposition, San Diego, California.

Petrykowski, J.C., A.L. Wright, and Y. Shi. 2013. Nucleate boiling theory for gaging fuel coolant interaction potential associated with LMR source term experiments. NURETH 15 Nuclear Reactor Thermal Hydraulics, in Pisa, Italy.

Pinnell, M.F., S. Franco, S. Preiss, R.P. Blust, and R. Beach. 2013. Engaging K-12 teachers in engineering innovation and design: Lessons learned from a pilot NSF research experience for teachers program. ASEE Annual Conference and Exposition and ASEE North Central Section Conference.

Pinnell, M.F., S. Franco, S. Preiss, R.P. Blust, J. Rowley, and R. Beach. 2013. Innovating education for the next generation of engineers - results of an NSF-RET program focused on innovation. 2013 ASEE Annual International Conference and Exposition.

Boopathy, K., and **M. Rumpfkeil**. 2014. Robust optimizations of structural and aerodynamic designs. AIAA, 2014-2595.

Kudla, T., and **M. Rumpfkeil.** 2014. Initial validation of a non-equilibrium Wilcox k-omega turbulence model in subsonic and transonic flow regimes. AIAA, 2014-0585.

Marks, C., **M. Rumpfkeil**, and G.W. Reich. 2014. Predictions of the effect of wing camber and thickness on airfoil self-noise. AIAA, 2014-3299.

Rumpfkeil, M. 2014. Using steady flow analysis for noise predictions. Eighth International Conference on Computational Fluid Dynamics ICCFD6.

Rumpfkeil, M., D. Robertson, and M.R. Visbal. 2014. Comparison of aerodynamic noise propagation techniques. AIAA, 2014-0021.

Boopathy, K., and **M. Rumpfkeil**. 2013. A multivariate interpolation and regression enhanced Kriging surrogate model. AIAA.

Boopathy, K., and **M. Rumpfkeil**. 2013. Building aerodynamic databases using enhanced Kriging surrogate models. AIAA Regional Conference, in Chicago, Illinois.

Kudla, T., and **M. Rumpfkeil.** 2013. Implementation and validation of a modified nonequilibrium Wilcox k-omega turbulence model. AIAA Regional Conference, in Chicago, Illinois.

Rumpfkeil, M. 2013. Optimization under mixed aleatory/epistemic uncertainty using derivatives. AIAA 2013-1754.

Rumpfkeil, M., M. Turner, R. Roberts, J. Van Kuren, T. Smith, and J. Bons. 2013. Thrust vectoring design project at six universities part II: Impact on student learning and lessons learned. ASME GT2013-95631 ed.

Turner, M., **M. Rumpfkeil**, R. Roberts, J. Van Kuren, T. Smith, and J. Bons. 2013. Thrust vectoring design project at six universities part I: Project description and final designs. ASME GT2013-95602 ed.

PRESENTATIONS

Gunasekaran, S., **A. Altman**, and K. Granlund. 2014. Trends in early vortex formation on a wall-to-wall plate in pure plunge. 10th Annual Dayton Engineering Sciences Symposium, October, in Dayton, Ohio.

Gunasekaran, S., **A. Altman**, and M. Ol. 2014. Errors in off-axis loading of off-the-shelf, 6–component force transducers: A cautionary tale. 10th Annual Dayton Engineering Sciences Symposium, October, in Dayton, Ohio.

Altman, A. 2014. Upgrades to the AFRL wind tunnels. Subsonic Aerodynamic Testing Association, June, in Bremen, Germany.

Altman, A. 2014. Upgrades to the University of Dayton Low Speed Wind Tunnel – The never-ending saga. Subsonic Aerodynamic Testing Association, June, in Bremen, Germany.

Gunasekaran, S., **A. Altman**, and M. Ol. 2014. Errors in off-axis loading of off-the-shelf 6-component force transducers: A cautionary tale. 10th Annual Dayton Engineering Sciences Symposium, October, in Dayton, Ohio. Altman, A. 2014. Upgrades to the AFRL wind tunnels. Subsonic Aerodynamic Testing Association, June, in Bremen, Germany.

Altman, A. 2014. Upgrades to the University of Dayton Low Speed Wind Tunnel–The never-ending saga. Subsonic Aerodynamic Testing Association, June, in Bremen, Germany.

Gunasekaran, S., and **A. Altman**. 2014. Wing performance insight from the self-preserved turbulent wake. 39thAnnual Dayton-Cincinnati Aerospace Sciences Symposium, March, in Dayton, Ohio.

Gunasekaran, S., and **A. Altman**. 2014. Identification of aircraft by their unique turbulent wake signature: Progress with experimental validation. 39th Annual Dayton-Cincinnati Aerospace Sciences Symposium, March, in Dayton, Ohio.

Gunasekaran, S., and **A. Altman**. 2014. Analysis of rapidly pitching wings using superposition of rotational circulation. 39th Annual Dayton-Cincinnati Aerospace Sciences Symposium, March, in Dayton, Ohio.

Memon, O., K. Wabick, **A. Altman**, and R. Buffo. 2014. Wingtip vortices from an exergy-based perspective. 39th Annual Dayton-Cincinnati Aerospace Sciences Symposium, March, in Dayton, Ohio.

Gunasekaran, S., and **A. Altman**. 2013. Wing performance insight from the self-preserved turbulent wake. 9th Annual Dayton Engineering Sciences Symposium, October, in Dayton, Ohio.

Gunasekaran, S., and **A. Altman**. 2013. Identification of any aircraft by its unique turbulence wake signature. 9th Annual Dayton Engineering Sciences Symposium, October, in Dayton, Ohio.

Memon, O., K. Wabick, **A. Altman**, and R. Buffo. 2013. Wingtip vortices from an exergy-based perspective. 9th Annual Dayton Engineering Sciences Symposium, October, in Dayton, Ohio.

Altman, A. 2013. Musings on vortex formation and shedding. 38th Dayton-Cincinnati Aerospace Sciences Symposium, March, in Dayton, Ohio.

Lego, Z., and **A. Altman**. 2013. Analysis of a variable camber wing during highly unsteady maneuvers. 38th Dayton-Cincinnati Aerospace Sciences Symposium, March, in Dayton, Ohio.

Gunasekaran, S., and **A. Altman**. 2013. Analysis of rapidly pitching wings using superposition of rotational circulation. 38th Dayton-Cincinnati Aerospace Sciences Symposium, March, in Dayton, Ohio.

Gunasekaran, S., and **A. Altman**. 2013. Identification of aircraft by their unique turbulent

wake signature: Progress with experimental validation. 38th Dayton-Cincinnati Aerospace Sciences Symposium, March, in Dayton, Ohio.

Wabick, K., O. Memon, and **A. Altman**. 2013. Exergy variation in wingtip vortices as a function of angle of attack. 38th Dayton-Cincinnati Aerospace Sciences Symposium, March, in Dayton, Ohio.

Wabick, K., **A. Altman**, K. Granlund, and M. Ol. 2013. Correction to classical lift curve slope at low Reynolds number. 38th Dayton-Cincinnati Aerospace Sciences Symposium, March, in Dayton, Ohio.

Bigelow, K.E. 2013. Engineering innovation: First-year student reflections convey impact of externally sponsored assistive device design projects. 2013 American Society of Engineering Education North Central Conference, April 6, in Columbus, Ohio.

Bigelow, K.E. (Presenter & Author), and K. Jackson (Author Only). 2013. The effects of rest and fatigue on balance performance in persons with multiple sclerosis. 37th Annual Meeting of the American Society of Biomechanics, September 5, in Omaha, Nebraska.

Choi, J.-K., and J.K. Kissock. 2014. The life cycle design perspective of industrial energy assessment. International Symposium on Green Manufacturing and Applications (ISGMA), International Precision Manufacturing, June 25, in Busan, South Korea.

Choi, J.-K. 2013. Photovoltaic recycling planning in the United States. 7th International Society for Industrial Ecology Biennial Conference, June 28, in Ulsan, Korea.

Choi, J.-K., and B.R. Bhavik. 2013. Assessing the effect of combined energy policies with an input-output framework. 21st International Symposium on Sustainable Systems and Technology, May 20, in Cincinnati, Ohio.

Choi, J.-K., K.P. Hallinan, and J.K. Kissock. 2013. Beyond industrial energy assessments: The life cycle design perspective. 10th Biennial Summer Study on Energy Efficiency in Industry, ACEEE, July 26, in Niagara Falls, New York.

Emo, S.M., **J.S. Ervin**, T. Michalak, and V. Tsao. 2014. Cycle-based vapor cycle system control and active charge management for dynamic airborne applications. SAE Aerospace Systems and Technology Conference, SAE, September, in Cincinnati, Ohio.

Sander, Z., S.S. Zabarnick, Z.J. West, and **J.S. Ervin**. 2014. Experimental and CFD with chemistry study of autoxidation and deposition in the JFTOT. CRC Aviation Meetings, CRC, April 30, in Alexandria, Virginia.

Hanchak, M.S., M.D. Vangsness, N. Gheorghiu, **J.S. Ervin**, L.W. Byrd, and J. Jones. 2013. Thin film evaporation model with retarded van der Waals' interaction. IMECE 2013, ASME, November, in San Diego, California.

Puntel, A., S.M. Emo, T. Michalak, **J.S. Ervin**, L. Byrd, V. Tsao, and T. Reitz. 2013. Refrigerant charge management and control for next-generation aircraft vapor compression systems. SAE Power Systems Conference, SAE, September, in Montreal, Canada.

Alshatshati, S. and **K.P. Hallinan**. 2013. At-scale prediction of building r-value and mass density from potentially aerial thermal image. DESS 2013, Dayton Engineering Sciences Symposium, October 30, in Dayton Ohio.

Kashani, A.R. 2014. Tuned damping of floor vibration. Webinar, Structural Engineering University, August, in Tehran, Iran.

Kinney, A., and B.J. Fregly. 2014. Does the human musculoskeletal system minimize passive muscle force during walking? 10th Annual Dayton Engineering Sciences Symposium, American Society of Mechanical Engineering Dayton Chapter, October 28, in Dayton, Ohio.

Ali, H., **A.P. Murray**, and D.H. Myszka. 2014. Zero structural error function generating mechanisms. 10th Annual Dayton Engineering Sciences Symposium, ASME, Wright State University, October 28, in Dayton, Ohio.

Amestiri, S., **A.P. Murray**, and D.H. Myszka. 2014. Singularity traces that describe motion characteristics of a mechanism. 10th Annual Dayton Engineering Sciences Symposium, ASME, Wright State University, October 28, in Dayton, Ohio.

Jayaprakash, V.K., **A.P. Murray**, and D.H. Myszka. 2014. Development and control of a mechanical regenerative braking and launch assist mechanism. 10th Annual Dayton Engineering Sciences Symposium, ASME, Wright State University, October 28, in Dayton, Ohio.

Watt, A., H. Smith, **A.P. Murray**, and D.H. Myszka. 2014. Shape changing polymer extrusion dies. 10th Annual Dayton Engineering Sciences Symposium, ASME, Wright State University, October 28, in Dayton, Ohio.

Almandeel, A., **A.P. Murray**, and D.H. Myszka. 2013. Statically equivalent serial chain modeling with Kinect and Wii

balance board. 9th Annual Dayton Engineering Sciences Symposium, ASME, Wright State University, October 29, in Dayton Ohio.

Giaier, K., D.H. Myszka, and **A.P. Murray**. 2013. Variable geometry dies for polymer extrusion, Regional 9th Annual Dayton Engineering Sciences Symposium, ASME, Wright State University, October 29, in Dayton Ohio.

Joyce, P., D.H. Myszka, and **A.P. Murray**. 2013. Development and design of an automotive mechanical spring starter. 9th Annual Dayton Engineering Sciences Symposium, ASME, Wright State University, October 29, in Dayton Ohio.

Li, B., **A.P. Murray**, and D.H. Myszka. 2013. Kinematic synthesis of planar, shape-changing rigid body mechanisms for design profiles with significant differences in arc length. 9th Annual Dayton Engineering Sciences Symposium, ASME, Wright State University, October 29, in Dayton Ohio.

Murray, A.P., D.H. Myszka, and L. Li. 2013. Using the singularity trace to understand linkage motion characteristics. International Design Engineering Technical Conference, ASME, August 7, in Portland, Oregon.

Myszka, D.H., Y. Tong, and **A.P. Murray**. 2013. Four-bar linkage synthesis for a combination of motion and path-point generation, International Design Engineering Technical Conference, ASME, August 7, in Portland, Oregon.

Nieman, J., D.H. Myszka, and **A.P. Murray**. 2013. Design optimization and simulation of a spring based regenerative braking system. 9th Annual Dayton Engineering Sciences Symposium, ASME, Wright State University, October 29, in Dayton Ohio.

Almandeel, A., A.P. Murray, and **D.H. Myszka**. 2013. Statically equivalent serial chain modeling with Kinect and Wii balance board. 9th Annual Dayton Engineering Sciences Symposium, ASME, Wright State University, October 29, in Dayton Ohio.

Giaier, K., **D.H. Myszka**, and A.P. Murray. 2013. Variable geometry dies for polymer extrusion, Regional 9th Annual Dayton Engineering Sciences Symposium, ASME, Wright State University, October 29, in Dayton Ohio.

Joyce, P., **D.H. Myszka**, and A.P. Murray. 2013. Development and design of an automotive mechanical spring starter. 9th Annual Dayton Engineering Sciences Symposium, ASME, Wright State University, October 29, in Dayton Ohio.

Li, B., A.P. Murray, and **D.H. Myszka**. 2013. Kinematic synthesis of planar, shape-changing rigid body mechanisms for design profiles with significant differences in arc length. 9th Annual Dayton Engineering Sciences Symposium, ASME, Wright State University, October 29, in Dayton Ohio.

Nieman, J., **D.H. Myszka**, and A.P. Murray. 2013. Design optimization and simulation of a spring based regenerative braking system. 9th Annual Dayton Engineering Sciences Symposium, ASME, Wright State University, October 29, in Dayton Ohio.

Kotha, V.M., and **J.C. Petrykowski.** 2014. 2-dimensional electromagnetic perturbations of a magnetohydrodynamic duct flow. AIAA Dayton Cincinnati Aerospace Sciences Symposium, March, in Dayton, Ohio.

Petrykowski, J.C. 2013. Nucleate boiling theory for gaging fuel coolant interaction potential associated with LMR source term experiments. 15th International Topical Meeting on Nuclear Reactor Thermal Hydraulics, International Atomic Energy Agency, American Nuclear Society, May, in Pisa, Italy.

Petrykowski, J.C., and Y.S. 2013. Analysis of the effectiveness of electromagnetic acoustic transduction in containerless processing operations. International Mechanical Engineering Conference and Exposition, November 15-21, in San Diego, California.

Rumpfkeil, M. 2013. Optimization under mixed aleatory/epistemic uncertainty. 38th AIAA Dayton / Cincinnati Aerospace Sciences Symposium (DCASS), March 6, in Dayton, Ohio.

Rumpfkeil, M., and K. Boopathy. 2013. A multivariate interpolation and regression enhanced Kriging surrogate model. 38th AIAA Dayton / Cincinnati Aerospace Sciences Symposium (DCASS), March 6, in Dayton, Ohio.

Rumpfkeil, M., and T. Kudla. 2013. Initial implementation and validation of a modified nonequilibrium Wilcox komega turbulence model. 38th AIAA Dayton / Cincinnati Aerospace Sciences Symposium (DCASS), March 6, Dayton, Ohio.

Rumpfkeil, M., and J. Roland. 2013. Analysis of a wing fuel tank energy model to determine heat sink possibilities. 38th AIAA Dayton / Cincinnati Aerospace

Sciences Symposium (DCASS), March 6, Dayton, Ohio.

ABSTRACTS

Petrykowski, J. C., and Y. Shi. 2013. Analysis of the effectiveness of electromagnetic acoustic transduction in containerless processing operations. 2013 International Mechanical Engineering Conference and Exposition, in San Diego, California.

Venkat, K.M., and **J.C. Petrykowski.** 2014. 2-Dimensional perturbations of a magnetohydrodynamic duct flow. AIAA Dayton Cincinnati Aerospace Sciences Symposium, in Dayton, Ohio.

POSTERS

Beach, R., K. Jackson, and **K.E. Bigelow**. 2013. Effect of compliant flooring on postural stability in an older adult population. 37th Annual Meeting of the American Society of Biomechanics, September 5, in Omaha, Nebraska.

Jackson, K., and **K.E. Bigelow**. 2013. Measures of balance performance are affected by a rested versus fatigued condition in people with multiple sclerosis. 2013 Ohio Physical Therapy Association Fall Scientific Symposium, October 11, in Columbus, Ohio.

Petit, D.J., J. Barrios, and **K.E. Bigelow**. 2013. Comparison of traditional and nonlinear gait analysis measures in individuals with multiple sclerosis. Gait and Clinical Movement Analysis Society, May, in Cincinnati, Ohio.

Smoot, S., D. Kinor, and **K.E. Bigelow**. 2013. Pilot study of the effect of an acute vestibular therapy on vestibular therapy on postural stability of children with autism spectrum disorder and typically developing children. 37th Annual Meeting of the American Society of Biomechanics, September 5, in Omaha, Nebraska.

Brecha, R.J., **K.P. Hallinan**, J.K. Kissock, R. Villoria-Siegert, B. Phil, and M. Austin. 2014. Targeting residential energy reduction for city utilities using historical utility and building data. NCSE, February 1, in Washington, D.C.

Raziei, A. , **K.P. Hallinan**, and R.J. Brecha. 2013. Energy cost optimization for system with both solar energy and conventional energy production and energy storage, and real time pricing. DESS 2013, Dayton Engineering Sciences Symposium, October 30, in Dayton Ohio.

Walker, D., **A. Kinney**, B. Fregly, T. Wright, and S. Banks. 2014. A novel approach to estimation of patient-specific muscle strength. 27th Annual Congress of the International Society for Technology in Arthroplasty, International Society for Technology in Arthroplasty, September, in Kyoto, Japan.

Walker, D., **A. Kinney**, A. Struk, B. Fregly, T. Wright, and S. Banks. 2014. Deltoid moment arms during abduction: A subject-specific musculoskeletal modeling study in healthy shoulders and shoulders with RTSA. 27th Annual Congress of the International Society for Technology in Arthroplasty, International Society for Technology in Arthroplasty, September, in Kyoto, Japan.

Walker, D., **A. Kinney**, A. Struk, B. Fregly, T. Wright, and S. Banks. 2014. How sensitive is the deltoid moment arm to joint center changes with RTSA? 27th Annual Congress of the International Society for Technology in Arthroplasty, International Society for Technology in Arthroplasty, September, in Kyoto, Japan.

MAGAZINES / TRADE PUBLICATIONS

Jackson, K., and **K.E. Bigelow**. 2013. Kickboxing: A creative approach to improving balance in patients with MS. *Lower Extremity Review* (March).

TECHNICAL REPORTS

Chiasson, A.D., M. Elsass, and J.S. Ervin. 2014. Studies of the low-temperature use of Jet A to replace JP-8 in tankers, fighters, bombers, and transport aircraft. AFRL-RQ-WP-TR-2014-0149 ed. WPAFB, OH: Air Force Laboratory-Fuels Branch.

Chiasson, A.D., M. Elsass, **J.S. Ervin**. 2014. Studies of the low-temperature use of Jet A to replace JP-8 in tankers, fighters, bombers, and transport aircraft AFRL-RQ-WP-TR-2014-0149 ed. WPAFB, OH: Air Force Laboratory-Fuels Branch.

WORKSHOPS

Choi, J.-K. 2013. NSF-SMART CN-Sustainable Manufacturing Roadmap Workshop, National Science Foundation, August 16, in Cincinnati, Ohio.

Choi, J.-K. 2013. Integrated sustainable systems design: PV recycling case. Industrial Ecology and System Thinking, ISIE, June 25, in Ulsan, Korea.

Pinnell, M.F., S. Preiss, and K.J. Brown. 2013. Engineering a ball

launcher. STEM Think Tank and Conference–Changing the Paradigm, July, in Nashville, Tennessee.

Pinnell, M.F., S. Preiss, and K.J. Brown. 2013. Getting started in STEM. STEM Think Tank and Conference–Changing the Paradigm, July, in Nashville, Tennessee.

CONTRACTS, GRANTS AND SPONSORED RESEARCH

Altman, A., and S.S. Altman. Wind tunnel flow diagnostics and test support. AFRL/RQVX, Federal, $198K. (October 2014 - October 2015).

Altman, A., and S.S. Altman. Wind tunnel flow diagnostics and test support. AFRL/RQVX, Federal, $195K. (October 2013 - October 2014).

Altman, A., and S.S. Altman. Wind tunnel flow diagnostics and test support. AFRL/RQVX, Federal, $185K. (October 2012 - October 2013).

Bigelow, K.E. Assistive device design - EGR 103 spring project, Kettering Health Network, Local, $2,868. (December 2012 - Present).

Bigelow, K.E. Assistive device design - kitchen devices for individuals with stroke, Kettering Health Network, Local, $9,759. (September 2012 - Present).

Bigelow, K.E. Assistive device design - vision therapy device, Kettering Health Network, Local, $7,372. (August 2012 - Present).

Bigelow, K.E. Assistive device design - iPad accessories, Kettering Health Network, Local, $2,705. (January 31, 2012 - Present).

Bigelow, K.E. Assistive device design - using the oven and microwave, Kettering Health Network and Neurorehab and Balance Center, $7,467.61. (November 2013 - May 2014).

Bigelow, K.E. Assistive device design – spring engineering innovation project, Kettering Health Network and Neurorehab and Balance Center, Local, $4,831.43. (November 2013 - May 2014).

Bigelow, K.E., R. Beach, S. Smoot, and S. Annas. Biomechanical evaluation of Evenflo products, Evenflo Inc., Industrial, Local, $32,718. (May 2013 - September 2013).

Bigelow, K.E. Changing mindsets: Framing design-for-the-disabled and other service-learning projects as entrepreneurial opportunities, Kern Family Foundation – Kern Entrepreneurship Engineering Network (KEEN) Private, $24,013. (May 2013 - June 2014).

Bigelow, K.E., and L. Bistrek. Improving student spatial visualization skills to increase retention and GPA, Procter and Gamble Fund's Higher Education Grant, Private, $6K. (December 2011 - Present).

Bigelow, K.E., M. Pinnell, A. Ciric, and L. Bistrek. Engage: Engaging students in engineering, NSF ENGAGE Mini-Grant, Federal, $10K. (August 2011 - January 2013).

Bigelow, K.E., and S. Smoot. Graduate student fellowship, National Science Foundation, Federal, $121,500. (August 2011 - August 2014).

Bigelow, K.E., and K. Jackson. The influence of a carbon fiber ankle foot orthoses (toe-off) on balance and gait in individuals with peripheral neuropathy, Allard USA Equipment Donation, $10K. (January 2013 - December 2013).

Ervin, J.S., **A.D. Chiasson,** and M.S. Hanchak. Evaluation of the thermal performance of vertical borehole heat exchangers. Geothermal Innovations, LLC, Private, $19,700. (May 2014 - December 2014).

Choi, J.-K. NETI – American Society of Engineering Education. University of Dayton, $3,800. (May 2014 - Present).

Choi, J.-K. Towards new national trend of energy efficiency: Novel integration of community based energy model. University of Dayton Research Council, $6,500. (June 10, 2014 - August 25, 2014).

Choi, J.-K. NSF CAREER writing research. University of Dayton, $6,251. (May 1, 2014 - August 14, 2014).

Choi, J.-K. Towards new national trend of energy efficiency: Novel integration of community based energy model. University of Dayton Research Council, $6,500. (May 1, 2014 - August 14, 2014).

Choi, J.-K. Design for environment: Using sustainable minds cloud based life cycle assessment software for crown equipment, CROWN Equipment Corporation, $3K. (December 20, 2013 - April 30, 2014).

Choi, J.-K. Modeling for optimized photovoltaic recycling systems in the United States, University of Dayton Research Council, University of Dayton, $6,500. (June 10, 2013 - August 25, 2013).

Choi, J.-K., and J.K. Kissock. University of Dayton Industrial Assessment Center, U.S. Department of Energy, Federal, $1.3M. (October 2011 - September 2017).

Ervin, J.S. Fuel tank heat transfer for Jet A freeze point studies.

AFRL/ NAVAIR / Defense Logistics Agency, Federal, $1.8M. (October 2010 - March 2015).

Ervin, J.S., D. Ballal, M.J. DeWitt, S.S. Zabarnick, T.F. Williams, and S.D. Stouffer. FA8650-10-2-2934. Fuels and Combustion Technologies for Aerospace Propulsion, Air Force Research Laboratories, Federal, $49.5M. (December 2010 - December 2016).

Ervin, J.S., L. Byrd, J. Jones, A.M. Briones, M. Hanchak, and S. Putnam. Understanding evaporation mechanisms. AFRL/ Air Force of Scientific Research, Federal, $600K. (September 2011 - September 2015).

Ervin, J. S., B.-H. Tsao, S.M. Emo, D.J. Johnson, J.R. Cory, and V. Tsao. Research and development in advanced power and thermal management technologies for advanced aircraft. Air Force Research Laboratory, Federal, $7.4M. (September 2012 - May 2015).

Cole, A., J. Cory, B. Cranston, S. Emo, **J.S. Ervin**, M. Hanchak, D. Johnson, W. Melke, and V. Tsao. Aircraft thermal management research, Air Force Research Laboratory, Federal, $5.5M. (May 2008 - November 2013).

Hallinan, K.P. Commercial building energy and process assessment program. Dayton Power and Light / Vectren, Private, $50K. (January 1, 2014 - December 31, 2014).

Hallinan, K.P., and R.J. Brecha. Commercial building recommissioning program, Vectren, University of Dayton, $175K. (August 2009 - December 2013).

Hallinan, K.P. Novel Carnot like Stirling solar engine, AFRL-Propulsion Directorate, Federal, $25K. (June 1, 2012 - May 15, 2013).

Kashani, A.R., J. Deng, and T. Chen. Rear axle whine noise abatement, Chrysler Corp, Private, $170K. (May 1, 2013 - June 1, 2014).

Kashani, A.R., and J. Monfort. Acoustics of augmentor, Air Force (funding a graduate student, Jeff Monfort), Federal, $70K. (May 1, 2012 - May 1, 2014).

Kissock, J.K. Pumping system optimization. University of Dayton Industrial Assessment Center Research, UD-Contract KHN, Sponsor: U.S. Department of Energy, $25,514. (2014).

Kissock, J.K. Industrial assessments. University of Dayton Industrial Assessment Center, Sponsor: U.S. Department of Energy, UD-Contract KHN-022, $1.3M. (October 2011 – September 2017).

Murray, A.P., and D.H. Myszka. Variable geometry dies for polymer extrusion - Research experiences for undergraduate supplement. National Science Foundation, Federal, $10K. (May 1, 2014 - August 16, 2014).

Murray, A.P., and D.H. Myszka. Variable geometry dies for polymer extrusion. National Science Foundation, Federal, $313,830. (August 1, 2012 - July 31, 2015).

Murray, A.P., and D.H. Myszka. Novel concepts for spring-based mechanical energy storage in motor vehicles. General Motors Global Research and Development, Private, $140K. (August 1, 2010 - December 31, 2013).

Murray, A.P., and D.H. Myszka. Variable geometry dies for polymer extrusion - research experiences for undergraduate supplement. National Science Foundation, Federal, $11, 200. (May 1, 2013 - August 16, 2013).

Murray, A.P., and **D.H. Myszka**. Variable geometry dies for polymer extrusion. National Science Foundation, Federal, $313,830. (August 1, 2012 - July 31, 2015).

Murray, A.P., and **D.H. Myszka**. Novel concepts for spring-based mechanical energy storage in motor vehicles. General Motors Global Research and Development, Private, $140K. (August 1, 2010 - December 31, 2013).

Murray, A.P., and **D.H. Myszka**. Variable geometry dies for polymer extrusion - research experiences for undergraduate supplement. National Science Foundation, Federal, $11, 200. (May 1, 2013 - August 16, 2013).

Rumpfkeil, M. Aerospace propulsion outreach program (APOP) 2015. AFRL/RZ, Federal, $10K. (August 1, 2014 - May 31, 2015).

Rumpfkeil, M. Research Council Seed Grant, University of Dayton, University of Dayton, $5K. (May 1, 2014 - July 31, 2014).

Rumpfkeil, M. DaVinci project (second extension). AFOSR, Federal, $16,946. (May 1, 2014 - September 30, 2014).

Rumpfkeil, M. DaVinci project (extension), AFOSR, Federal, $16,946. (November 1, 2013 - April 30, 2014).

Rumpfkeil, M. AFRL subject matter expert, AFOSR, Federal, $77,933. (May 1, 2013 - April 7, 2014).

Rumpfkeil, M. DaVinci project, AFOSR, Federal, $51,300. (November 1, 2012 - October 31, 2013).

Rumpfkeil, M. . AFRL subject matter expert, AFOSR, Federal, $28,363. (August 15, 2012 - May 1, 2013).

Rumpfkeil, M. Aerospace propulsion outreach program (APOP) 2014, AFRL/RZ, Federal, $12K. (August 1, 2013 - May 31, 2014).

Rumpfkeil, M. Research council seed grant, University of Dayton, $5K. (May 1, 2013 - July 31, 2013).

Rumpfkeil, M. Aerospace propulsion outreach program, AFRL/RZ, Federal, $14,500. (August 1, 2012 - May 31, 2013).

BROTHER JOSEPH W. STANDER SYMPOSIUM

Asari, V.K., and F. Albalooshi. 2014. Real-time object segmentation from network camera using touch screens. Brother Joseph W. Stander Symposium 2014, University of Dayton, April 9, in Dayton, Ohio.

Asari, V.K., and T. Aspiras. 2014. Rotation-invariant feature tracking using Gaussian ringlet intensity distributions (GRID). Brother Joseph W. Stander Symposium 2014, University of Dayton, April 9, in Dayton, Ohio.

Asari, V.K., and A. Braun. 2014. An interactive robust artificial intelligence-based defense electro robot (RAIDER) using a pan-tilt-zoom camera. Brother Joseph W. Stander Symposium 2014, University of Dayton, April 9, in Dayton, Ohio.

Asari, V.K., and Y. Diskin. 2014. 3D anomaly detection using structure from motion. Brother Joseph W. Stander Symposium 2014, University of Dayton, April 9, in Dayton, Ohio.

Asari, V.K., and Y. Gong. 2014. Brain machine interface for controlling a robot arm. Brother Joseph W. Stander Symposium 2014, University of Dayton, April 9, in Dayton, Ohio.

Asari, V.K., and C. Gross. 2014. Brain machine interface collection of EEG signals for controlling a robot arm. Brother Joseph W. Stander Symposium 2014, University of Dayton, April 9, in Dayton, Ohio.

Asari, V.K., and E. Krieger. 2014. Nonlinear image enhancement and super resolution for enhanced object tracking. Brother Joseph W. Stander Symposium 2014, University of Dayton, April 9, in Dayton, Ohio.

Asari, V.K., and K. Krucki. 2014. Human re-identification in multi-camera systems. Brother Joseph W. Stander Symposium 2014, University of Dayton, April 9, in Dayton, Ohio.

Asari, V.K., and L. Milliken. 2014. High resolution 3D reconstruction using a hexacopter drone. Brother Joseph W. Stander Symposium 2014, University of Dayton, April 9, in Dayton, Ohio.

Asari, V.K., and B. Nair. 2014. Optical flow based Kalman tracker for body joint prediction and tracking using HOG-LBP matching. Brother Joseph W. Stander Symposium 2014, University of Dayton, April 9, in Dayton, Ohio.

Asari, V.K., and B. Nair. 2014. Regression based time-invariant modeling of motion-shape based features for human action recognition. Brother Joseph W. Stander Symposium 2014, University of Dayton, April 9, in Dayton, Ohio.

Asari, V.K., and P. Sidike. 2014. Advanced image processing for automatic pipeline right-of-way threat detection. Brother Joseph W. Stander Symposium 2014, University of Dayton, April 9, in Dayton, Ohio.

Asari, V.K., and P. Sidike. 2014. Visibility improvement through hyperspectral band integration. Brother Joseph W. Stander Symposium 2014, University of Dayton, April 9, in Dayton, Ohio.

Asari, V.K., and N. Varney. 2014. LiDAR data analysis for region segmentation and object classification. Brother Joseph W. Stander Symposium 2014, University of Dayton, April 9, in Dayton, Ohio.

Albalooshi, F., and **V.K. Asari**. 2013. Video segmentation for automatic extraction of human body region for action and activity recognition. Brother Joseph W. Stander Symposium 2013, University of Dayton, April 17, in Dayton, Ohio.

Arigela, S., and **V.K. Asari**. 2013. An automatic and locally tunable transformation function for fog and haze removal in aerial imagery. Brother Joseph W. Stander Symposium 2013, University of Dayton, April 17, in Dayton, Ohio.

Arigela, S., and **V.K. Asari**. 2013. An automatic visibility improvement and object detection system for wide area surveillance applications. Brother Joseph W. Stander Symposium 2013, University of Dayton, April 17, in Dayton, Ohio.

Arigela, S., and **V.K. Asari**. 2013. Enhancement of images captured in complex lighting environments for visual quality improvement. Brother Joseph W. Stander Symposium 2013, University of Dayton, April 17, in Dayton, Ohio.

Aspiras, T., and **V.K. Asari**. 2013. Analysis of EEG signals for the recognition of emotional states. Stander Symposium Involvement, Brother Joseph W. Stander Symposium 2013, University of Dayton, April 17, in Dayton, Ohio.

Cashion, K., C. Gross, and **V.K. Asari**. 2013. Brain machine interface using electroencephalograph data as control signals for a robotic arm. Brother Joseph W. Stander

Symposium 2013, University of Dayton, April 17, in Dayton, Ohio.

Cui, C., B. Nair, Y. Diskin, and **V.K. Asari.** 2013. Pose invariant face recognition and tracking for human identification. Brother Joseph W. Stander Symposium 2013, University of Dayton, April 17, in Dayton, Ohio.

Diskin, Y., and **V.K. Asari**. 2013. Automatic scene rendering for unmanned aerial systems. Brother Joseph W. Stander Symposium 2013, University of Dayton, April 17, in Dayton, Ohio.

Diskin, Y., and **V.K. Asari**. 2013. Wide area surveillance for security automation. Brother Joseph W. Stander Symposium 2013, University of Dayton, April 17, in Dayton, Ohio.

Gross, C., T. Aspiras, and **V.K. Asari**. 2013. EEG action encoding. Brother Joseph W. Stander Symposium 2013, University of Dayton, April 17, in Dayton, Ohio.

Jackovitz, K., V. Santhaseelan, Y. Diskin, and **V.K. Asari**. 2013. Image registration, moving object detection and tracking in wide area motion imagery. Brother Joseph W. Stander Symposium 2013, University of Dayton, April 17, in Dayton, Ohio.

Mathew, A., F. Albalooshi, and **V.K. Asari**. 2013. Water body segmentation in aerial imagery. Brother Joseph W. Stander Symposium 2013, University of Dayton, April 17, in Dayton, Ohio.

Nair, B. (Presenter & Author), and **V.K. Asari** (Author Only). 2013. Intrusion detection on oil pipeline right of way (row) using monogenic signal representation. Brother Joseph W. Stander Symposium 2013, University of Dayton, April 17, in Dayton, Ohio.

Nair, B., and **V.K. Asari**. 2013. Regression based learning of human actions from video using histogram of flow and local binary flow patterns. Brother Joseph W. Stander Symposium 2013, University of Dayton, April 17, in Dayton, Ohio.

Nair, B., B. Natarian, Y. Diskin, and **V.K. Asari**. 2013. Robust artificial intelligence-based defense electro robot (RAIDER). Brother Joseph W. Stander Symposium 2013, University of Dayton, April 17, in Dayton, Ohio.

Powar, N., and **V.K. Asari**. 2013. Facial expression analysis. Brother Joseph W. Stander Symposium 2013, University of Dayton, April 17, in Dayton, Ohio.

Santhaseelan, V., and **V.K. Asari**. 2013. Detection of whale blows in infrared video. Brother Joseph W. Stander Symposium 2013, University of Dayton, April 17, in Dayton, Ohio.

Santhaseelan, V., and **V.K. Asari**. 2013. Extracting context information from aerial imagery for aiding threat detection. Brother Joseph W. Stander Symposium 2013, University of Dayton, April 17, in Dayton, Ohio.

Asari, V.K., and F. Albalooshi. 2014. Real-time object segmentation from network camera using touch screens. Brother Joseph W. Stander Symposium 2014, University of Dayton, April 9, in Dayton, Ohio.

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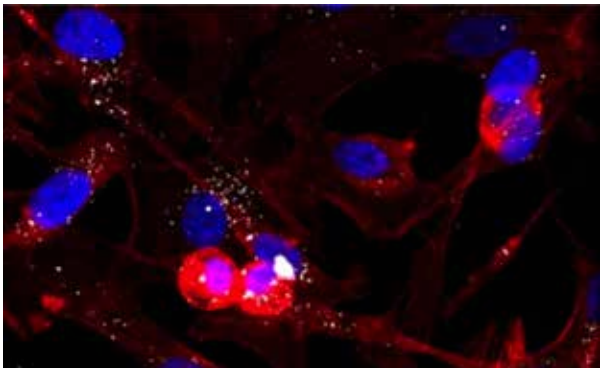

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