ALUMNI UPDATE: CATCHING UP WITH MATTHEW VANCE, PH.D.

One of the first students ever to receive a Ph.D. in aviation, Matthew Vance, Ph.D. talks about his experiences in the military, industry, academia and what led him to pursue a doctoral degree in his 50s.

You have traveled all around the country in your pursuit of knowledge. Walk us through those decisions.

When it came time to select a college, there was not a college or university in my home state of New York that offered an Aeronautical Engineering degree. I needed a significant scholarship to afford out of state tuition and found that with the United States Navy Reserve Officer Training Corps (NROTC) program. I accepted a four-year NROTC tuition scholarship at the University of Michigan, thus beginning my 24 year active association as a Naval Officer. Upon completing my first tour, I searched for graduate education opportunities. Purdue had an excellent reputation and needed an Aviation Officer – here was a potential fit! In addition to my NROTC Assistant Professor responsibilities, I taught in their Aviation Technology program and pursued a MS in aeronautical and astronautical engineering.

What compelled you to apply to Parks College to earn your PhD after working for a few years?

I was a lower level executive at Boeing for eight years. When Boeing started offering severance packages, I took the opportunity in early 2011 to pursue a teaching career. It was the boldest move of faith I have ever taken. About three months later, while networking, I contacted Professor Ik Kwon at SLU’s John C. Cook School of Business. Upon completing my first tour, I searched for graduate education opportunities. Purdue had an excellent reputation and needed an Aviation Officer – here was a potential fit! In addition to my NROTC Assistant Professor responsibilities, I taught in their Aviation Technology program and pursued a MS in aeronautical and astronautical engineering.

What was your research area originally? Did it change throughout your time at Parks?

Originally my job and research focus was the initiation of an Unmanned Aerial Systems program at SLU; it did not change during my tenure. My dissertation probed on what I considered to be the last component of aviation likely to become unmanned – the transport of human passengers in revenue service on fully autonomous airliners.

Your Ph.D. is in aviation, but you had committee members from psychology and engineering. Can you tell us why this makes sense?

The topic I chose is a hybrid examination involving aviation science, quality engineering and psychology. It explores more a future challenge than a current problem, leveraging a balance of social science and quality engineering principles. For my qualifying exam and my dissertation committee, I reached out to those with an impressive depth of knowledge and their inquisitive, open, encouraging manner and minds. I believe my dissertation was much stronger for this diversity of input and guidance.

STORY CONTINUED ON PAGE 6.
The Office of Parks’ Graduate Programs is excited to share with you our Winter 2015 newsletter. I hope you enjoy reading our news!

I am pleased to report that Graduate Education at Parks continues to receive a high number of applications nationally and internationally. We have processed over 30 applications and have admitted many highly qualified students for the Masters and Doctoral programs in Aviation and Engineering for the 2016 Spring semester. We will welcome about 15 new M.S. and Ph.D. students this Spring alone. Seven students received their Master’s Degree in Engineering and one student received his PhD in Engineering this past summer. We have ten students hoping to graduate Fall 2015 in Aviation Sciences and Engineering.

Our graduate faculty are always open to improving the experience for our students. In collaboration with SLU’s Graduate Education office, we have offered the first SLU and Parks Graduate Faculty Mentoring Workshop on August 20th. The workshop included guest speakers and collaborative discussion. You can read more about that workshop in this issue. Parks continues diligently working on establishing a new leadership master’s degree that will be the first in the region. Our learning outcomes are in the process of being established for our Masters and Doctoral programs to ensure consistent and uniform standards for our programs. I am very excited to announce the addition of the Master degree in Engineering Physics which began Fall 2015. This degree will provide opportunity for engineers and physicists to collaborate in research and graduate education to provide interested students with a cutting-edge STEM focused postgraduate education. Parks Masters Engineering Program is now part of the SLU-INTO joint program to recruit and increase international enrollment. INTO brings ambitious international students and leading universities together. The joint program provides an exceptional educational experience to help international students succeed in a fast-moving, globally competitive world while studying in the US. Also, a 5 year accelerated BS/MS engineering program is nearing final approval through University committees. We hope to begin to offer this program starting Fall 2016.

Our Graduate Seminar has been well attended by our graduate students and included research presentations of renowned professionals in several engineering fields. See a list of speakers from our Fall semester in this issue for an example of a typical semester’s speakers. We believe exposing our graduate students to professionals working in industry, entrepreneurship, and academia gives them real-world knowledge that complements their coursework and research.

Please take a moment to browse through our web page at parks.slu.edu/grad to learn more about our outstanding graduate programs and let us know how we can continue to improve.

On behalf of Parks Graduate Programs, I wish you a Happy Holiday season!

Riyadh Hindi, Ph.D., P.Eng.
Professor and Director
Parks College Graduate Programs

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SUMMER 2015 GRADUATES

Naveed Ahmed — M.S. in Engineering, Biomedical Engineering; Advisor: Dr. Silviya Zustiak; Thesis Title: “Novel Multiwell Platform for Rapid Preparation of Polyacrylamide Stiffness Assay for Drug Screening Applications”

Seyedborhan Alhosseinhamedani — M.S. in Engineering, Biomedical Engineering; Advisor: Dr. Andrew Hall; Thesis Title: “Optimization of Imaging Technique for Identification of the Prostatic Artery Pathway Using Physical Phantom Models”

Reynaldo Flores — M.S. in Engineering, Biomedical Engineering; Advisor: Dr. Scott Sell; Thesis Title: “Preliminary Evaluation of Electro-spun Polycaprolactone Scaffolds Embedded with Borate Based Bioactive Glass Beads”

Xianchen Ge — M.S. in Engineering, Aerospace & Mechanical Engineering; Advisor: Jianfeng Ma; Thesis Title: “Numerical Investigation of Advanced Manufacturing Processes”

Ajit George — Ph.D. in Engineering, Biomedical Engineering; Advisor: Dr. Gary Bledsoe; Dissertation Title: “Development of a Methodology for Visualization and Geometric Characterization of Myelinated White Matter Neural Fibers”


Jacob Laktas — M.S. in Engineering, Biomedical Engineering; Advisor: Dr. Scott Sell; Thesis Title: “Optimization of Air-Impedance Electrospun Structures for Tissue Engineering”

Feng Zhang — M.S. in Engineering, Aerospace & Mechanical Engineering, Non-Thesis; Advisor: Dr. Arif Malik

PROPOSED FALL 2015 GRADUATES

Michael Benne — M.S. in Aviation, Non-Thesis
Ronald Brumback — M.S. in Aviation, Non-Thesis
Sheila Buswell — M.S. in Engineering, Biomedical Engineering
Faiz Kassar — M.S. in Engineering, Civil Engineering, Non-Thesis
Fatma Elzahraa Madkour — M.S. in Engineering, Civil Engineering, Non-Thesis
Cesar Gomez Martinez — M.S. in Engineering, Civil Engineering, Non-Thesis
Gregory Pasken — M.S. in Engineering, Aerospace & Mechanical Engineering
Huan Shen — M.S. in Engineering, Aerospace & Mechanical Engineering
Grant Spencer — M.S. in Engineering, Aerospace & Mechanical Engineering

NEW PARKS COLLEGE GRADUATE STUDENTS

Syed Ahmad, Ph.D. Aviation
Hussain Alsaeed, Ph.D. Aviation
Mamdouh Alghaythi, Ph.D. Electrical & Computer Engineering
Muhab Alsadat, M.S. Civil Engineering
Akhand Ashek, M.S. Civil Engineering
Salar Malekzadeh, Ph.D. Aerospace & Mechanical Engineering
Samuel Moeller, unclassified
Osama Mohammed, Ph.D. Civil Engineering
Jeanne Switzer, M.S. Civil Engineering
Fareed Syed, M.S. Aerospace & Mechanical Engineering
Jennifer Tennison, unclassified
John Venn, M.S. Biomedical Engineering
Yao-Chi Yu, M.S. Electrical & Computer Engineering
NEW GRADUATE FACULTY

This fall semester Parks welcomes two new Graduate Faculty, Jenna Gorlewicz, Ph.D. and Chris Carroll, Ph.D. Gorlewicz and Carroll both had a chance to share their research at this year’s Graduate Seminar, and are both mentoring Parks graduate students.

JENNA GORLEWICZ, PH.D.
Jenna L. Gorlewicz received her B.S. in mechanical engineering from Southern Illinois University Edwardsville in 2008, before pursuing her PhD in mechanical engineering at Vanderbilt University, where she worked in the Medical and Electromechanical Design (MED) Laboratory. At Vanderbilt, she was a National Science Foundation Fellow and a Vanderbilt Educational Research fellow. Dr. Gorlewicz is currently a faculty member in the Department of Aerospace and Mechanical Engineering at Saint Louis University. She is the director of the Intelligent Mechatronic, Haptic, and Robotic Systems (IMeHRS) Lab. Her research interests are in haptic and human-machine interfaces, medical devices and robotics, educational technologies, engineering education, and entrepreneurship.

CHRIS CARROLL, PH.D.
Dr. Carroll received his B.S. and M.S. from the University of Tennessee, Knoxville in civil and environmental engineering (CEE) and received his Ph.D. in CEE from Virginia Tech, where he was a Cunningham-Via Fellow and College of Engineering Dean's Teaching Fellow. Dr. Carroll was a faculty member at the University of Louisiana at Lafayette from 2009 to 2015, where he initiated and directed the structural engineering laboratory before joining the faculty in the Department of Civil Engineering at Saint Louis University in the fall of 2015. He has also co-hosted five documentaries in conjunction with the History, Science, and Discovery channels focused on topics ranging from Cold War nuclear bunkers to engineering in ancient Rome and Egypt.

TRANSPORTATION INFRASTRUCTURE CONFERENCE
On Friday, December 4, Parks College teamed up with the Missouri Department of Transportation and Missouri University of Science and Technology to put on the Fourth Annual Transportation Infrastructure Conference. Dr. Riyadh Hindi was Co-Chair of the conference and offered Saint Louis University to host this year’s event, which drew approximately 100 attendees from industry and academia. This year’s conference included recent findings in the areas of advanced construction materials, non-destructive testing, and structural health monitoring of transportation infrastructure. Eleven Civil Engineering graduate students from Parks College attended, and four of them presented posters. Congratulations are due to Mehdi Motaleb for receiving an Honorable Mention as part of the student poster competition.
The Clare Boothe Luce fund administrators offered to sponsor a visit for a woman speaker in a STEM field to speak to our graduate students. After some scouting and consulting some of our female graduate students, we invited Dr. Catherine Ambrose from The University of Texas Medical School to speak at our Graduate Seminar. Dr. Ambrose is an Associate Professor and Director of the Biomechanics, Bone Histomorphometry, and Bone Densitometry Laboratories in the Department of Orthopaedic Surgery. She received her Bachelor of Science in Mechanical Engineering from Washington University and went on to complete her Master of Science in Biomechanical Engineering and her PhD in Mechanical Engineering from the University of Texas at Austin. As part of her visit, Dr. Ambrose met with administrators, faculty, and students, in addition to a sit down lunch with select female faculty and students. Four of our female graduate students also presented information about the CBL program and their current research prior to Graduate Seminar. Her official visit ended with a Happy Hour at the Field House. We were lucky to have such a prestigious speaker share her experiences and research with our students, and to the Clare Boothe Luce fund administrators for helping to arrange Dr. Ambrose’s visit.
In Summer 2015 graduate students (Md Ashiquzzaman, Li Hui, and Carlos Merino) from Parks College developed in collaboration with the Southern Illinois University of Edwardsville SIUE the experimental program for the Illinois Department of Transportation (IDOT) research project “Effectiveness of Exterior Beam Rotation Prevention Systems for Bridge Deck Construction”. The project was under supervision of Dr. Riyadh Hindi (SLU PI) and Dr. Nader Panahshahi (SIUE). Bridge girders are typically uniformly spaced transversely with the deck extending past the exterior girders, thereby resulting in an overhang. Overhang construction often leads to a torsional load on the girder system that can lead to problems in girder bridges during construction, especially when the finishing machine rail is placed on the cantilevered portion of the form work. The main issue is excessive lateral rotation in the fascia girder, which can cause potential problems of construction safety and maintenance, and permanent deformations. Field problems have been reported in Illinois where the fascia girders experienced excessive rotation during construction. Many thanks go to Darren Green, Parks Lab Technician, for the great help he provided in designing and building the experimental specimen and setup.

**RESEARCH COLLABORATION WITH SIUE**

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**ALUMNI UPDATE: CATCHING UP WITH MATTHEW VANCE, PH.D. (continued from cover story)**

**Q** What was the biggest obstacle you faced when completing your PhD?

**A** My qualifying exam was both a humbling and pivotal experience in professionalism and depth of knowledge. There was a facet of knowledge in which I was found deficient that required a summer of introspection, further preparation and a re-examination. I needed that time to accept complete responsibility for my work and to explain every step with patience and academic authority.

It seems like you’ve had a few different careers. Can you walk us through those changes?

I had been commissioned a U.S. Navy Officer the same day I graduated with my BSAE and therefore was immediately on active USN duty. My second college transition occurred after obtaining my MSAE. I was still on active duty but programmed to leave six months later for civilian life. I had accepted an Operations Analyst position with McDonnell Douglas in St. Louis, MO; so this transition was measured, gradual and self-initiated. The third college transition was really just a change of role. I spent 18 months with direct hands-on flight instruction of SLU students and loved every single minute. My objective at SLU was to be added to the faculty; however, opportunities were limited. I earned my Ph.D. five months into this period of flight instruction and continued to flight instruct until the time that I left SLU for OSU (Oklahoma State University), where I accepted a tenure-track faculty position as their Professional Pilot representative.

**Q** What about your experience at Parks prepared you for your current position?

As I reflect on my experiences at Parks, three significant exposures occurred to help me transition into collegiate aviation as faculty: 1) a research grounding in CASR, 2) my Ph.D. course work and dissertation work re-ignited an intellectual stimulation that had become stale in the corporate world, and 3) my direct hands-on interaction with students supervising them as student workers, and teaching them as a SLU Adjunct Professor and as a professional full-time Flight Instructor. These experiences have provided me a solid foundation with which to make a positive impact in my academic service.

**Q** Are you currently conducting any research or special projects?

I am getting grounding with a new research portfolio here at OSU which includes emphasis in these three areas, 1) reducing aircrew attributable error through examination of attitude, 2) Unmanned Aerial Systems and their impacts on United States society, and 3) aptitude for autonomous commercial airline travel.

**Q** What are your future plans?

As I settle into my third career, my immediate objective is to establish myself in my new surroundings and be a contributor and leader at OSU. In addition to teaching responsibilities, I do intend to carry one flight student each semester, to stay actively involved in our flight program. I am also eager to find a research contribution path that has sustainable momentum. I am very happy with my new OSU team and my wife and I are very happy with our new small town environment.
Mary Jennerjohn and Miranda Pizzella, Clare Booth Luce Fellows, traveled to Seoul, Korea this summer for a program that was a joint collaboration between the Henry Luce Foundation and Ewha Womans University in Seoul. The purpose of the trip, according to Miranda, was to promote equal opportunities for female graduate students in STEM. This was the first visit to Seoul for both women, and both expressed deep appreciation to Ewha Womans University and the Henry Luce Foundation for the amazing opportunity. Read below to learn more about their experience.

Tell us about this program for which you were selected.

**Mary:** The program was the ELIS (Ewha Luce International Seminar) Expanding Horizons International Seminar for Women Graduate Students in STEM. This was the inaugural year of the program, and will continue for two more years.

**Miranda:** The program is comprised of lectures, workshops and seminars fostering four keys for success: leadership, empowerment, network and vision. The program also included several industry visits both in Seoul and Jeju Island. The program also fostered new cultural experiences through cooking classes of traditional Korean dishes, learning how to write in Korean and a field trip to Jeju Island.

How many women were chosen?

**Mary:** Overall, 21 women were chosen between East Asia [12] and the United States [9].

How long were you in Seoul?

**Miranda:** The program was two and a half weeks. All participants stayed in the international dorms at Ewha Womans University.

What were the conditions of your trip? What were you supposed to accomplish while there?

**Mary:** The international seminar was based on four cores: Leadership, Vision, Networking, and Empowerment. Through these four cores, the students were challenged to complete all tasks through various cultural visits, lectures, open forums, etc. Additionally, each student gave an open forum presentation with various subjects including 1. Women who influenced your role in science. 2. Issues with Science and 3. Futuristic Research in which you would like to engage. My topic was the first topic in which I presented on my personal experiences and how Amelia Earhart and Dr. Sally Ride influenced my career goals.

What did you get to do in your leisure time?

**Mary:** In our leisure time, Miranda and I liked to explore on our own and with our newly made Korean friends. We participated in popular Korean activities including karaoke. The program also put together a couple of various outings for the participants including a trip to Jeju Island (much like Hawaii), learning to play Korean drums, learning how to write Korean in 45 min, a full day Seoul tour (including a visit to the DMZ), and a Korean cooking class.

**Miranda:** There was plenty of leisure time given to explore the city and our Korean friends helped us do so. Each evening a Korean participant would plan an activity and dinner for all participants to join in. This could be something nearby campus or in a neighboring city. We saw local markets, traditional restaurants, museums, theater performances and much more. There were also several cultural experiences built into our schedule such as a demilitarized zone or DMZ tour where we were able to view the edge of North Korea, a Seoul City tour where we visited Gyeongbokgung Palace, the North Seoul Tower, and the Korean War Museum ending with a Korean buffet dinner in Insa-dong.

What did you learn from this experience?

**Miranda:** From this experience I had the opportunity to broaden my knowledge in other STEM related fields. I learned ways to better communicate cross culturally and how to make and maintain relations with other scientists. I learned many things about Korean culture and broke down my own personal barriers and fears of leaving my own traditions. I also learned that most of my concerns as a woman in STEM are shared by other females and that it is okay to reach out for help and support.

**Mary:** I have learned a lot from this experience, mostly how to be a better communicator and leader in science. Additionally, I believe I have learned how I should carry myself as a woman in engineering, a male dominated field. I have gained a network of international female scientist leaders that will help guide me through my career. I also have gained 20 new friends in which I hope to keep in contact. I will carry these experiences with me through my graduate career.

To learn more about the ELIS, visit http://womeninstem.ewha.ac.kr/xe/welcome.
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