

TEACHERS TAKE FLIGHT WORKSHOP

A 4-DAY HANDS-ON WORKSHOP FOR EDUCATORS

KASHMIR WORLD FOUNDATION

IN PARTNERSHIP WITH



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TEACHERS TAKE FLIGHT WORKSHOP



Teachers Take Flight Workshops gives educators around the world an opportunity to participate in the DaVinci Challenge, learn how to teach Build a Drone based curriculum, and connect with conservationists for mission-focused drone projects. Created by Kashmir World Foundation, the DaVinci Challenge teaches design, fabrication, customization, and optimization of aerial robotics systems; inspiring participants to innovate and invent as they focus on mission applications.

In 2016, KwF launched the first Teachers Take Flight workshop with a goal to expand the DaVinci Challenge program by modifying or developing new STEM based drone curriculum for schools and universities.

Participating teachers spearheaded new opportunities at their academic institutes all throughout the US. Carlos Castro, a teacher from Woodbridge Senior High School in Virginia, launched a pilot program for 150 students building, programming, and flying with 30 DaVinci Challenge quadcopter drone kits in the Spring of 2017. Phil Wiechec, a teacher from

Mountainview High in California, launched a pilot drone program at his school for 32 students building 12 DaVinci Challenge hexacopter drone kits.

In March 2017, KwF launched the first conservation-focused field research “Fly for Conservation Expedition 001.” Teachers Take Flight participant Professor Jon Caris from Smith College in Massachusetts and 8 students joined the KWF Team on a field expedition to St. Catherines Island to learn about KwF drone and technology programs for sea turtle conservation. The students collaborated on using drones to collect imagery and created 3D maps for other conservation efforts of the island. Fly for Conservation Expedition included engineers, scientists, conservationists, educators, and students for a three-day fully immersive program into the world of endangered species conservation using unmanned aerial systems (UAS).

Dr. Burchan Aydin an Assistant Professors at Texas A&M University-Commerce attended the 2018 Teachers Take Flight Workshop. Through his efforts the 2018 Teachers Take Flight workshop has traveled to Dallas Texas in partnership with Texas A&M University-Commerce.



ABOUT KASHMIR WORLD FOUNDATION

Founded in 2008, Kashmir World Foundation (KwF) is a nonprofit organization, based in Great Falls Virginia. KwF projects integrate art as a means of innovation, science as a benchmark for invention, and technology as the result of creative solutions. Through global collaboration, Kashmir World Foundations' projects improve the lives of humans and wildlife worldwide.



KwF divisions include Kashmir Academy, Kashmir Rose, Kashmir Robotics.



KASHMIR ACADEMY

Kashmir Academy, the educational division of KwF, was developed to help scientists, educators, and to see robotic aircraft as tools that can be used to improve the world we live in. Innovative projects are embracing drones as companions that are vital to solving local and global catastrophes. Kashmir Academy created the DaVinci Challenge program as an excellent blend of science, technology, engineering, art and math (STEAM) to teach the design fabrication, customization, and operation of unmanned aerial systems (UAS).

KASHMIR ACADEMY PROGRAMS

DaVinci Challenge: Build a Drone Workshop



DaVinci Challenge: Build a Drone Workshop is the first workshop developed by Kashmir Academy, and was created to encourage students of all ages to participate in an innovative and hands-on workshop. The workshop teaches the basics of drone design, fabrication, robotic systems integration, 3D printing, and piloted and autonomous flying techniques to solve real world challenges. More than 500 students have graduated from the program with a Drone Operator Certificate. Together, teams from the workshop have built and flown over 300 DaVinci Drones.

DaVinci Challenge: Teachers Take Flight

Teachers Take Flight workshops inspire and prepare educators to empower students in solving real world challenges in a diverse and collaborative environment

through STEAM education via autonomous UAS. This workshop has been developed with a focus on educating and training teachers and professors on the design, fabrication, and utilization of UASs. The objective of the workshop is to encourage and enable educators to either develop new curriculum, or further enhance their current curriculum by applying the knowledge they gain from the DaVinci Challenge at their schools and colleges.

DaVinci Challenge: Fly for conservation



The Fly for Conservation Workshop is designed for researchers and scientists. The workshop consists of educational lectures and presentations, which identify the need for aerial technology for wildlife conservation and research. Participants learn about fully autonomous mission focused drones, rules and regulations necessary to safely operate them, and how to customize them for their applications. During the workshop, students receive hands on training on how to build, program and operate drones used for piloted and autonomous drone flights, giving them the tools necessary to incorporate UASs into current wildlife conservation efforts. KwF has conducted workshops in Florida, Costa Rica and 2018 in Mexico.

KASHMIR ROBOTICS



Kashmir Robotics is the science & technology division of KwF, with a mission to integrate deep learning neural networks to air and ground robotic systems that achieve optimal solutions of conservation and counter poaching tools.



Through collaboration with scientists and engineers around the world, Kashmir Robotics develops custom autonomous systems with the ability to perceive their environment and take actions that optimizes mission success with unmanned aerial systems.

KASHMIR ROBOTICS' PROJECTS

Wildlife Conservation UAV Challenge

In 2013, the Wildlife Conservation unmanned aerial vehicle (UAV) Challenge (wcUAVc) was launched to foster innovation and invention in the design, fabrication, and utilization of unmanned aircraft to assist with counter poaching and illicit wildlife trafficking. It called on students, hobbyists, and academics to collaborate in a design, build, and fly challenge that emphasized the integration of sensors, embedded systems, and communications in a robust and high endurance aircraft for counter poaching of endangered species. In just a few months, 150 teams from 40 different countries made the wcUAVc become the world's largest and most distributed aircraft research effort.



MiSHELL Sea Turtle Drones

MiSHELL is a fully autonomous custom drone with the ability to collect and process data onboard. MiSHELL is being "trained" to perform the functions of



human beach walkers, such as locating and identifying turtle tracks, following the tracks to locate nests, observing nests, and reporting on their location and condition. MiSHELL will also be used to detect and

measure the intensity of threats caused by beach erosion and predation of nests and hatchlings. MiSHELL will not only assist current nesting beach monitoring efforts, it will also have the ability to monitor remote locations and beaches that are currently inaccessible to humans due to natural barriers, and threats to personal security.

Protect Snow Leopards

Kashmir Robotics has been researching a variety of technologies to augment conservation and protection programs for snow leopard surveillance and identification. Drones have been identified as a tool to collect data from hard to access camera traps and provide aerial imagery on snow leopard behavior and habitat. These systems will be used to identify individual snow leopards based on pattern recognition algorithms, record real time GPS locations of snow leopards, and 3D mapping of the terrain. Data collected by the drones, including aerial imagery and GPS coordinates of snow leopards, will be emitted to a central ground station. Information will then be disseminated to the appropriate individuals, such as snow leopard biologists for conservation and protection methods and sheep herders for timely warnings and alerts.



KASHMIR ROSE

kashmir rose Kashmir Rose is the art history division of KwF creates handcrafted eco-friendly products to financial support the development of Kashmir Robotics technologies and provide grants and scholarships for Kashmir Academy. www.kashmir-rose.com for more information.



ABOUT TEXAS A&M UNIVERSITY-COMMERCE

Since 1889, Texas A&M University-Commerce has been known as a leader in providing an excellent education. It's because we care about people and relationships. We're a big-name university, but our focus is helping you achieve success. A&M-Commerce faculty and staff will know your name and work closely with you to understand your goals and dreams. Our professors will care about your growth and be your loudest supporters when you walk across the stage to get your degree.

We realize a great education is about more than attending class. It's about making friends, memories, and a name for yourself as someone who's passionate about learning. Earning an A&M-Commerce degree and being part of the Texas A&M University system will not only look good on your resume, it will give you the confidence you need to compete in the marketplace.

Visit Texas A&M University-Commerce to discover:

- **Quality:** Part of the A&M University system, offering you the knowledge and confidence to compete in the real world.
- **Programs:** More than 100 graduate and undergraduate degrees.
- **Faculty:** Our faculty are as well known for mentoring students as they are for teaching. Small classes provide a great learning atmosphere where you're taught on a personalized basis by some of the best professors in their fields of expertise.
- **Research:** With a new multi-million dollar science building on campus and some of the most cutting-edge educational models, A&M-Commerce provides research opportunities to undergraduates as well as graduates. Where else can undergraduates develop research projects alongside world-class faculty and graduate students? A&M-Commerce, of course.
- **Students:** A diverse student body of approximately 6,000 undergraduates and 4,000 graduates.
- **Study abroad:** 18 programs, including study abroad in Australia, China, England, Peru, Russia, and South Africa.
- **Internships:** Real-world work opportunities in nearby Dallas and surrounding communities.
- **Financial aid and scholarships:** More than \$75,000,000 offered yearly to make tuition affordable.
- **Campuses:** Our main location in Commerce, plus several additional campuses and online programs.
- **Diversity:** A&M-Commerce is proud of its diverse student population, many who are first-generation college students. We are committed to helping you feel at home and providing the support, encouragement, and attention you need to succeed. You'll make friends with students from many different cultures and backgrounds.
- **Great place to learn:** Excellent facilities, including a state-of-the-art science building, new Student Center, and recreation center.
- **Activities:** Make lifelong friends and enjoy a vibrant student life with more than 120 student organizations, plus recreational opportunities.
- **Graduates:** More than 95 percent of our 2006 graduates are employed or attend graduate school, where they excel in their chosen fields. They are sought after in the marketplace for their knowledge, skill, confidence, and ability to use their education to solve real-world problems and make a difference in whatever careers they pursue.



PRESENTER BIOS

Princess Aliyah Pandolfi

aliyah@kashmirworldfoundation.org

Executive Director, Kashmir World Foundation



Princess Aliyah Pandolfi is the Executive Director of Kashmir World Foundation. She is an inspirational and innovative educator with a vision to change the world through tools of knowledge. Drawing on her success in real estate, business, and international finance, Princess Aliyah founded KwF in September 2008. Her approach is to enlighten others through education and communications, to make people aware of the broader context in which they live, and empower with real and financial infrastructures within which communities can flourish. Clean water, food, and shelter are needed to survive but education and communications are needed to evolve.

"When art, science, and technology are combined with theoretical and practical learning activities, students can have better understanding of the broader context innovation and invention play in the improvement of civilizations." Through the DaVinci Challenge, participants are encouraged to focus on a potential change to improve the world, then build a drone to help achieve that change.

Dr. Ronald Pandolfi

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Director, Kashmir Robotics



Dr. Ronald Pandolfi has 30 years of experience in the application of surveillance, communications, robotics, aircraft and weapons systems to counter poaching of endangered species. As Founder and Director of the Technology Assisted Counter Poaching (TACP) network, he has been working behind the scenes for over 25 years, equipping rangers and other ground forces with the tools needed to defeat poachers and the criminal organizations engaged in trafficking of endangered species.

Dr. Pandolfi designed and engineered the DaVinci Challenge multi-copter drone kits for educational and instructional purposes. He lectures students during workshops to collaborate using open source hardware and software for mission-focused applications. Equipped with onboard processing these drones have self-learning algorithms programmed on single board computers and sensors integrated throughout the autonomous unmanned aerial systems.

Dr. Burchan Aydin,

burchan.aydin@tamuc.edu

Assistant Professor of Engineering and Technology, Texas A&M University-Commerce



Dr. Aydin is an industrial engineering academician with a bachelor's degree from Middle East Technical University, Ankara, Turkey, and a doctoral degree from Texas Tech University, Lubbock, TX. Besides industrial engineering degrees, he holds a master's degree of organizational development from University of the Incarnate Word, San Antonio, TX. He is a U.S. Federal Aviation Administration (F.A.A.) licensed remote pilot for small unmanned air systems. His research emphasis is using unmanned air vehicles for firefighting including building and wildfires, granted by Texas A&M University Engineering Experiment Station (TEES). Dr. Aydin has been teaching for 3 years at A&M Commerce including subjects such as unmanned air vehicles for emergency and disaster response, unmanned air vehicles for commercial applications, economics, statistics, supply chain management, sustainability, emerging technologies, and project management.



PRESENTER BIOS

Dr. Andrea M. Graham

Interim Department Head and Associate Professor of Engineering and Technology at Texas A&M University-Commerce



Compassionate, motivational, and driven are just some of the words used to describe Dr. Andrea M. Graham, Interim Department Head and Associate Professor of Engineering and Technology at Texas A&M University-Commerce (TAMUC). In her position at TAMUC, Dr. Graham wears many hats including interim department head and academic advisor for the Industrial Engineering Undergraduate program. Her research focus areas include Engineering Education and Sustainable Transportation.

In addition to the PhD in Industrial Engineering, Dr. Graham holds a BS degree in Mechanical Engineering from Tuskegee University and a master's Degree in Technology Management from Stevens Institute of Technology. Andrea holds affiliations in the Institute of Industrial Engineering, Society of Women Engineers, Phi Kappa Phi Honor Society, American Society of Engineering Education and Delta Sigma Theta Sorority, Inc.

As a staunch educator, Dr. Graham's career mission and philosophy is that of a bridge builder. Building bridges, both literally and figuratively, that will eliminate the gap between academia and industry and create pathways to innovation and access to a better way of life for future generations.

Dr. Brent Donham

Dean of the College of Science & Engineering at Texas A&M University-Commerce



Dr. Brent Donham was appointed the Dean of the College of Science & Engineering at Texas A&M University-Commerce in 2014. Throughout his academic career, Dr. Donham has been actively involved in engineering / STEM education. He has led the development and implementation of multiple engineering and engineering technology degrees, along with award winning career awareness programs.

Dr. Donham began his academic career at Richland College, Dallas, Texas, where he served in a number of capacities including the Executive Dean of the School of Engineering & Technology, and the Associate Vice President, Engineering & Technology / Educational Transitions. Dr. Donham was part of the leadership team that resulted in Richland College becoming the first community college to receive the Malcolm Baldrige National Quality Award.

In addition to his higher education experience, Dr. Donham has more than twelve years of industry experience with Sandia National Laboratories and E-Systems (now L-3 Communications). Dr. Donham holds a bachelor's degree in Electrical Engineering from New Mexico State University, a master's degree in Electrical Engineering from Stanford University, and a doctorate in Educational Administration from Texas A&M University-Commerce.



PRESENTER BIOS

Italo Cruz

Applied Technology Specialist at Rogers O'Brien Construction



Italo Cruz is an Applied Technology Specialist at Rogers O'Brien Construction (RO); he is responsible for leveraging innovative technology to simplify construction processes. Italo spent most of his life in construction helping his father in early years in Brazil, which sparked the interest during college years. Italo's first project in The U.S. was the Old Parkland Campus in Dallas, Texas, which allowed him to understand the role a subcontractor have in a job site. When he joined RO, he worked on projects at Southern Methodist University (SMU), SMU Crain Promenade and SMU Southeast Development, as an Office Engineer and Quality Manager.

In the Applied Technology and Processes Department, Italo is in charge of the drone program in Dallas, with a drone fleet of 24 drones spread around Texas. He implemented, drone ground control points (GCP's) and 360 Reality Capture to improve accuracy and communication on the job sites. Recently, he has been training new drone pilots and implementing automatic cloud services to more than 750 users Texas wide.

In college, he spent the summers working on internships, participated in TEXO competitions, and won two years in a row the Synchro 4D Scheduling Student Competition 2014, 2015. After graduating with a Bachelor of Science in Construction Engineering with a minor in Business from Texas A&M Commerce, he is seeking a post-graduate program in Virtual Design and Construction (VDC) in the Center of Integrated Facility Engineering (CIFE) at Stanford University.



TEACHERS TAKE FLIGHT WORKSHOP

WORKSHOP LOCATION

June 11 – 13

9 am – 4 pm

Mesquite Metroplex Center
2600 Motley Dr.
Mesquite, TX 75150

FLIGHT DAY LOCATION

June 14

9 am – 5 pm

Texas A&M University-Commerce Observatory
1610 County Road 4208
Campbell, TX, 75428

WORKSHOP SCHEDULE

MONDAY, JUNE 11, 2018

9:00 am to 9:45 am	Welcome, Introductions & Workshop Objectives
9:45 am to 10:30 am	The Leonard da Vinci Method of Teaching Design & Function: Princess Aliyah, KwF
10:30 am to 10:45 am	Break
10:45 am to 11:30 am	Existing and Future Drone Application F.A.A. Regulations: Dr. Burchan Aydin, TAMUC
11:30 am to 12:00 pm	Drones as a Tool in Teaching Robotic Sciences: Dr. Ronald Pandolfi, KwF
12:00 Am to 1:00 pm	Lunch Break
1:00 pm to 2:30 pm	Assemble Frame, Integrate Power & Propulsion
2:30 pm to 2:45 pm	Break
2:45 pm to 4:00 pm	Integrate Power & Propulsion

TUESDAY, JUNE 12, 2018

9:00 am to 9:30 am	Day 1 Review
9:30 am to 10:00 am	Mission Planner Overview
10:00 am to 10:30 pm	Avionics Integration & Calibration
10:30 am to 10:45 am	Break
10:45 am to 12:00 pm	Avionics Integration & Calibration
12:00 pm to 1:30 pm	Lunch Break, Guest Speakers Dr. Graham, TAMUC Italo Cruz, Rogers O'Brien Construction
1:30 pm to 2:30 pm	Avionics Integration & Calibration



2:30 pm to 2:45 pm	Break
2:45 pm to 3:15 pm	How Flying Creatures Teach Aerodynamics & Embedded Sensors: Princess Aliyah, KwF
3:15 pm to 4:00 pm	Avionics Integration & Calibration

WEDNESDAY, JUNE 13, 2018

9:00 am to 9:30 am	Review Day 2
9:30 am to 10:00 am	RC Transmitter Programming
10:00 am to 10:30 am	RC Transmitter Control Practice
10:30 am to 10:45 am	Break
10:45 am to 11:30 am	Dallas ISD Teachers: Flying Creatures Research & Presentations
11:30 am to 12:00 pm	Mission Planner Training
12:00 pm to 1:15 pm	Lunch Break, Guest Speaker Dr. Donham Integrated Circuit, TAMUC
1:15 am to 2:30 pm	Mission Planner Training
2:30 pm to 2:45 pm	Break
2:45 am to 4:00 pm	Pre-flight Planning, Safety, Bench & Ground Tests

THURSDAY, JUNE 14, 2018

9:00 am to 10:00 pm	Pre-flight Planning, Safety, Bench & Ground Tests
10:00 am to 12:00 pm	Drone Flight Tests
12:00 pm to 1:00 pm	Lunch Break
1:00 am to 4:00 pm	Mission Planning & Autonomous Flights
4:00 pm to 5:00 pm	Awards Ceremony

FRIDAY, JUNE 15, 2018 (OPTIONAL DAY AT MESQUITE METROPLEX CENTER)

9:00 am to 12:00 pm	F.A.A. Remote Pilot Exam Training: Dr. Burchan Aydin, TAMUC
12:00 pm to 1:00 pm	Lunch Break
1:00 am to 4:00 pm	F.A.A. Remote Pilot Exam Training: Dr. Burchan Aydin, TAMUC



TEACHERS TAKE FLIGHT WORKSHOP OBJECTIVES

- Assemble drone and connect power and propulsion.
 - Frame
 - Motors
 - Electronic Speed Controllers (ESCs)
 - Power distribution cable
 - Power Module
- Integrate and program avionics.
 - Flight controller
 - GPS/Compass
 - Wifi adapter
- Program and calibration Radio Controlled (RC) Transmitter
- Document build in engineering log book.
 - Sketch or photo of each component
 - Description of each step
 - Troubleshooting analysis
- Learn to use Mission Planner software for monitoring, planning and executing flight for safety and autonomy.
- Fly your drone with a Transmitter while your partner monitors flight tests in Mission Planner software.
- Monitor flights on Mission Planner software while your partner fly's the drone with the Transmitter.
- Plan and execute autonomous flight mission in Mission Planner Software.
- Research and present on Flying Creature aerodynamics.

