

FLY FOR CONSERVATION

KASHMIR WORLD FOUNDATION

PERUAÇU CAVES
NATIONAL PARK (BRAZIL)

FEB 4-8



2019

In Partnership with WWF Brazil

WWW.KASHMIRWORLDFOUNDATION.ORG



About the Workshop



In February 2019, approximately 30 participants will join Kashmir World Foundation (KwF) in partnership with World Wildlife Fund (WWF-Brazil) as KwF deliver hands-on unmanned aerial systems (UAS) training to conservationists across six days in Brazil's Cerrado. UAS, commonly known as drones, are crucial players in the modern fight to protect ecologically challenged environments and endangered species. Using drones, conservationists are empowered by the latest technology to monitor environmental challenges such as wildfires, drought, and deforestation.



In Brazil's Cerrado, a large area known as the Sertão Veredas-Peruaçu (SVP) protected area mosaic is at the center of 2019's Fly for Conservation Workshop. Within the time frame of this workshop, conservationists will participate in field training utilizing experts from KwF to build and program a fully customized drone, and then learn how to safely and effectively use it to assess, monitor, and track ecological damages in the SVP Protected Area Mosaic of Brazil's Cerrado. Fully customized UAS such as the kind that will be built and programmed during this workshop have many benefits over commercial, prepackaged drones. Some of these include lower cost, sustainability, and the technical ability to adjust and fix them in the field.

Using the customized drones, conservationists will create 3D maps for the management and detection of fires, habitat restoration, and tree identification using machine learning. 3D mapping using UAS is a useful and cost-effective way to visualize the unique characteristics of environments and learn how to best protect them.



Brazil's Cerrado is the largest savanna in South America, taking up about as much space as Mexico, and housing thousands of native animal, fish, and insect species. In the span of only 50 years, the Cerrado has seen the loss of upwards of 50% of its natural forestation and grasslands to farming and urbanization. The disruption of the Cerrado biome and the Sertão Veredas-Peruaçu (SVP) Protected Area Mosaic which holds the majority of its natural vegetation and hosts countless endangered species has put wildlife at risk and contributed to global warming.

KWF is pleased to be partnering with WWF for this third international Fly for Conservation workshop. In the past, KWF has teamed up with people and organizations such as Sea Turtle Conservation in Florida, Georgia Sea Turtle Center in Georgia, Reserva Playa in Costa Rica, and Pronatura Península de Yucatán in Mexico to bring UAS technology to conservationists across the globe via Fly for Conservation workshops aiming to help combat sea turtle endangerment.

For the 2019 Fly for Conservation Workshop in Brazil, Kashmir World Foundation will turn its attention to dryer land, and the well-being of the Cerrado's many unique animal species; but will continue its broader mission to combat ecological destruction and wildlife endangerment. KWF hopes that this mission will improve conservation efforts and help save the lives of the Cerrado's most crucial inhabitants.



Schedule



Monday: February 4, 2019

9:00 am to 10:00 am	Welcome, Introductions & Workshop Objectives
10:00 am to 10:45 am	Drone Components Search and Learn
10:45 am to 11:00 am	Break
11:00 am to 12:30 pm	Assemble Frame, Integrate Power & Propulsion
12:30 pm to 1:30 pm	Lunch Break
1:30 pm to 2:30 pm	Assemble Frame, Integrate Power & Propulsion
2:30 pm to 3:30 pm	Avionics Integration
3:30 pm to 3:45 pm	Break
3:45 pm to 4:30 pm	Avionics Integration & Calibration
4:30 pm to 5:30 pm	Brazil Drone Safety and Regulations, Felipe Spina Avino, WWF

Tuesday: February 5, 2019

9:00 am to 9:30 am	Day 1 Review
9:30 am to 10:00 am	Mission Planner Overview
10:00 am to 10:45 pm	Avionics Integration & Calibration
10:45 am to 11:00 am	Break
11:00 am to 12:30 pm	Avionics Integration & Calibration
12:30 pm to 1:30 pm	Lunch Break
1:30 pm to 2:00 pm	RC Transmitter Control Practice
2:00 pm to 3:00 pm	Mission Planner Training
3:30 pm to 3:45 pm	Break
3:45 pm to 5:00 pm	Pre-flight Planning, Safety, Bench & Ground Tests
5:00 pm to 6:00 pm	Drone Application Discussion & RoundTable

Wednesday: February 6, 2019

9:00 am to 9:30 am	Review Day 2
9:30 am to 10:45 am	Pre-flight Planning, Safety, Bench & Ground Tests
10:45 am to 11:00 am	Break
11:00 am to 12:30 pm	Pre-flight Planning, Safety, Bench & Ground Tests
12:30 pm to 1:30 pm	Lunch Break
1:30 pm to 3:30 pm	Drone Flight Tests
3:30 pm to 3:45 pm	Break
3:45 pm to 5:30 pm	Drone Flight Tests

Thursday: February 7, 2019

9:00 am to 10:45 pm	Drone Flight Tests
10:45 am to 11:00 am	Break
11:00 am to 12:30 pm	Mission Planning & Autonomous Flights
12:30 pm to 1:30 pm	Lunch Break
1:30 pm to 5:30 pm	Mission Planning & Autonomous Flights

Friday: February 8, 2019

9:00 am to 12:00 pm	Field Drone Tests, Training and Data Collection
12:30 pm to 1:30 pm	Lunch Break
1:30 pm to 4:00 pm	Field Drone Tests, Training and Data Collection
4:00 pm to 5:00 pm	Awards Ceremony

KwF Instructors



Princess Aliyah Pandolfi

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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 to empower with real and financial infrastructures within which communities can flourish. Clean water, food, and shelter are needed to survive. Education and communications are needed to evolve.



Dr. Ronald Pandolfi

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Director, Kashmir Robotics & Technology Assisted Counter Poaching (TACP) Network

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.



Dan Smith

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Director of Academia, Kashmir World Foundation

Dan Smith is the Director of Academia. He graduated with two Masters of Physics Degrees from Princeton University and University of Maryland, and an Undergraduate Physics Degree from Stanford University. A true “Renaissance Man” with advanced degrees and education in philosophy, physics, and theology, Smith is developing a cosmology for the *Best Possible World*. Whether contributing to conservation work in the field, participating in Davinci Challenge Workshops, or hosting discussions amongst colleagues, Smith expands the perceptions of all involved, placing their work within the perspective of an expanding universe of concepts, ideas, and technologies.



Henrique Lopez Blank

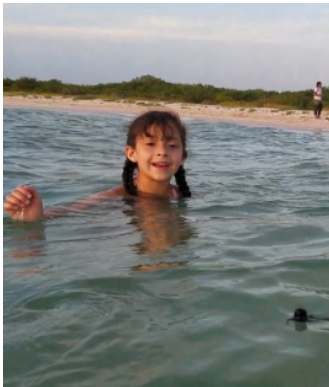
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Engineering & Film Volunteer, Past Intern - Kashmir World Foundation

Henrique Lopez Blanck is a dynamic and mission focused engineer with expertise and interest in a wide array of fields, and the determination to achieve the highest quality of results. His experience encompasses all areas of development, data science, and natural language processing.

Currently, Henrique is a Systems Analyst who works with SESI's Innovation Center in Health Technologies to help build pipelines for continuous development that will ensure the availability of applications. As a Tech Leader on a variety of projects, Henrique is also responsible for guiding and supporting teams of developers for the construction of company products.

Henrique interned with the Kashmir World Foundation (KwF) during the summer of 2015. He helped develop the DaVinci Challenge: Build a Drone Workshop by documenting the engineering steps to build a Kashmir Robotics Drone and enhanced the efficiency and effectiveness of the workshop. Henrique also filmed and edited multiple promotional KwF videos for programs and projects involving wildlife conservation and counter poaching of endangered species. Henrique holds a Master's degree in Engineering and Knowledge Management from the Federal University of Santa Catarina - UFSC (2019). His double undergraduate sandwich degrees are in Information and Communication Technologies at UFSC (2016) and in Computer Engineering at La Salle University (2015) in the United States, funded by CNPq/Capes.



Kashmir Rose Pandolfi

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Drone Test Pilot, Kashmir World Foundation

Kashmir Rose Pandolfi is a Drone Test Pilot at Kashmir Robotics and has mentored at Teachers Take Flight and Fly for Conservation workshops for Kashmir Academy. She has over three years of experience in designing, fabricating and operating custom aircraft. The sign of a good test pilot is the ability to execute the mission with precision, while always being prepared to take corrective action when something goes awry. Kashmir is the only test pilot at Kashmir Robotics with a perfect record of successful test flights.

Kashmir has traveled to more than 35 countries to learn about wildlife conservation and how technology can be used to help protect endangered species through custom drones and robotic systems equipped with artificial intelligence. She has been invited as a guest speaker for many Girls in Technology events to inspire students in learning how integrating science, technology, engineering and math can help solve real world challenges for endangered species. When not working on aircraft, Kashmir enjoys attending the second grade at Great Falls Elementary, mixed media visual arts, caring for her chickens and cat Mimi, hiking with her dog Milan, and playing with her friends.

WWF Instructors



Felipe Spina Avino

Biologist and Senior Conservation Officer - WWF Brazil

Felipe Avino is an experienced and multifaceted Brazilian Biologist that has worked in South America, Africa and Europe. He holds a master in Education for Sustainability, with a focus on Climate Change, at London South Bank University. Felipe is from the remote and biodiverse island of Príncipe (São Tomé and Príncipe-África) where he once acted as a Terrestrial Biodiversity Conservation Manager for Fauna & Flora International (FFI). Today, Felipe works as a Sr. Conservation officer for WWF Brazil Forest Initiative, mainly with protected areas, biodiversity monitoring, and conservation technologies in the Amazon and Cerrado. Some of his current projects involve using drones to help in the management and patrolling of protected areas, as well as to assist traditional communities with agroecology and restoration of tropical forests.

About KwF and WWF Brazil



Kashmir World Foundation (KwF)



Founded in 2008, Kashmir World Foundation develops sustainable projects with an emphasis on the importance of education, training, employment to empower communities to protect their environment and endangered species. We encourage the traditional arts while integrating appropriate technologies to transform social and economic structures.

World Wildlife Foundation (WWF) - Brazil



Some of the most diverse regions in the world are found in Brazil, including the Atlantic Forest, Pantanal and Amazon. The Amazon River is one of the longest rivers in the world and the rainforest covering the Amazon Basin represents almost half of the world's rainforests. One in every 10 existing species of plants and animals is found within the Amazon and other parts of the country.

Deforestation in Brazil, mainly a result of ongoing agricultural expansion, is threatening rare and vulnerable habitats such as the Amazon and the Atlantic Forest. Other environmental problems facing the country include air and water pollution in Rio de Janeiro, Sao Paulo and other large cities as well as land and wetland degradation, and illegal wildlife trade. WWF -Brazil seeks to tackle these challenges and protect the environment of the vibrant region.

KwF Divisions



KASHMIR ROBOTICS

Integrates custom unmanned aerial systems (UAS) with AI, allowing them to process data and assist in the conservation of endangered species



KASHMIR ROSE

Creates handcrafted products to sustain the art history of Kashmir while funding technologies for Kashmir Robotics and students with Kashmir Academy



KASHMIR ACADEMY

Educates scientists, academics, and conservationists in the use of custom AI-equipped UAS for the protection of endangered species

kashmir rose



Acknowledgements



The 2019 Fly for Conservation Workshop (Brazil) was made possible by the collaboration of **World Wildlife Foundation (WWF)** and **Kashmir World Foundation (KwF)**. WWF is generously providing various important resources through the Forest Innovation Fund, including senior conservation officer (Felipe Avino) to act as project coordinator. KwF is contributing time and technical expertise during the workshop, developing machine learning model for tree species identification, and helping to create 2D/3D maps for soil analysis after forest fires.

Special Thanks to:

Parque Nacional Cavernas do Peruaçu for providing training space and housing.

Felipe Avino, WWF Brazil, for making the workshop possible by offering his expertise in the field, providing logistics, and helping to organize the expedition.

Meg Symington, WWF Washington – Amazon, for helping with drone kit logistics from Washington to Brazil.

Park Rangers/Local Participants for participating in the workshop and will act as conservation ambassadors to the Cerrado.

KwF Volunteers and Interns for contributing their essential technological, writing, and design contributions which helped to make this workshop happen:

Travel Volunteer

Henrique Lopez Blank, Volunteer, KwF (*Federal University of Santa Catarina, MA Engineering and Knowledge Management, 2019*) KwF thanks Henrique for volunteering to translate technical workshop documents and for filming a short documentary about the project.

Computer Science Team

KwF thanks the following interns for their developing the tree species machine learning model.

- **Afreen Hameed** (*New Jersey Institute of Technology, BS Computer Science and Applied Physics, 2020*)
- **Lei Shi** (*Columbia University, MA Electrical Engineering and Signal Processing, 2018*)
- **Jennifer Meng** (*Columbia University, MA Quantitative Methods in Social Sciences, 2018*)

Graphic Design/Social Media Team

KwF thanks the following interns for their help in writing and designing project materials.

- **Nikki Green** (*University of Canberra, Australia, M.A. Graphic Design, 2019*)
- **Felicia Young** (*Southern New Hampshire University, B.A. Graphic Design, 2018*)
- **Kelly Gibson** (*Arizona State University, B.S. Technical Communications, 2019*)
- **Amanda Zhang** (*Yale University, B.A. Economics, B.A. Environmental Studies (Concentration in Conservation and Biodiversity, 2021)*)

2D/3D Mapping Team

KwF thanks the following interns for their work creating and analyzing 2D, vector and 3D maps.

- **Christian Lau** (*Western Kentucky University, BS, Geography and Environmental Studies, Geographic Information Systems, 2019*)
- **Amanda Zhang** (*Yale University, BA, Economics and Environmental Studies with a Concentration in Conservation and Biodiversity, 2021*)