



Aerial Filming Drone Research Takes Flight

Denis Loboda and his Toronto-based start-up Air Xposure needed help to get their idea for a new drone off the ground.

Currently, it's both difficult and expensive for film makers to shoot high-quality aerial footage. Some attempt to design their own drones and attach a camera to it. But they lack the professional-grade engineering design and often fail. They run into two key problems: high winds and vibration. High winds often cause a drone to become unstable and susceptible to crashing. Vibration can wreak havoc on the camera, causing any footage to be unusable.

Other home-made models can't even get in the air, as they're not designed to support the weight of a camera and still be able to fly with speed and agility.

Another alternative involves renting a helicopter, expensive cameras and other bulky cinematic equipment. But the cost and time-consuming set up puts it out of reach of most filmmakers on a modest budget.

Air Xposure wanted to provide a solution and create a cost-effective aerial filming drone that could be set-up quickly and shoot quality aerial shots. It had to be reliable, agile and able to support a professional-grade camera that weighed up to 15 pounds.

With this wish list, Air Xposure partnered with Sheridan College through a \$25,000 grant from the Natural Sciences and Engineering Research Council of Canada (NSERC) and worked together for six months.

Leading the design was Professor Dan Mashatan from Sheridan's School of Mechanical and Electrical Engineering and Technology. Having a particular interest in drones, he brought his experience and expertise, along with the cutting-edge resources of Sheridan's Centre for Advanced Manufacturing and Design Technologies (CAMDT).

That included a machining facility, 3D printing equipment, and instrumentation labs that provided essential resources for designing, building, and testing this new drone system. In these labs dozens of tests were conducted in the fields of aerial motion control, vibration, stress analysis, control systems and air dynamics. Together, they methodically moved from a proof-of-concept into a final working prototype – a drone weighing just 20 pounds, powered by eight small propellers that can easily carry a high-grade cinematic camera.

This innovative technology will enable Air Xposure to support cinematographers (ranging from short-film production to motion pictures) in capturing high quality shake-free and vibration-free aerial footage with ease.

This technology could also be used for drone applications and in other industries such as surveying and mapping; mining; construction; agriculture and law enforcement and security, noted Dan.

During the project, everyone gained valuable knowledge. Denis and other Air Xposure staff became familiar with 3D printing tools, CAD drawings, as well as other manufacturing

“I strongly suggest partnering with Sheridan. Whether the project is for proof of concept, manufacturing, or creating a final product, Sheridan's resources, expertise and knowledge will be beneficial to any company.”

– Denis Loboda, Co-Founder, Air Xposure

machines and processes. Meanwhile, two Sheridan students assisting Dan received a crash course in the fields of automation, control, programming and mechanical machining, as well as aerial cinematography.

“This kind of applied research industry project is good for the students, because they get the real application of what they have studied,” said Dan. “They learned new technologies and just as important, they learned how to conduct themselves professionally.”

For Sheridan faculty, some of the elements of this project will be integrated into the teaching curriculum of Sheridan's Electromechanical Technology diploma programs.

“We were also able to apply what we learned from the vibration testing and analysis to improve all of our other drone platforms,” said Denis, who added, “It's a pleasure to work with people who are passionate about your technology and who are not afraid to push the boundaries.”

Do you have a problem that needs solving? Contact us today to get started:
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