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Profile:
EdgeData LLC

While it may be a newcomer to the wind energy industry, EdgeData is making great strides in big-data collection with its wind-specific BladeEdge analytics software that will be on display at Windpower 2016.

By Anna Claire Howard

In North Dakota, a team of data experts, software developers, and wind energy industry veterans have joined forces to advance the state of unmanned aircraft systems (UAS, or more commonly known as drones) used in the operations and maintenance of industrial wind farms.

With the help of a $450,000 matching grant from the North Dakota Centers of Excellence Commission that was administered by the University of North Dakota (UND), Edge-Data was founded in early 2015 by CEO and Chairman Lonnie Bloomquist, CTO Jeff Thorsteinson, and President Chris Shroyer. The company is working in conjunction with LM Wind Power, the world's leading independent blade manufacturer, and other wind farm owners and operators to develop a system that utilizes UAS data-collection technology from cameras and sensors to inspect and monitor wind tower blades, thereby decreasing worksite safety risks, minimizing annual energy production (AEP) losses due to poor blade conditions, identifying necessary repairs prior to costly service, and extending the life of the turbines.

EdgeData is based at the university's Tech Accelerator, a facility that supports UND's mission of economic development and where the company houses a flight laboratory and hangar to conduct UAS flights and training indoors.

"EdgeData has been able to do what it said it would do through the many partnerships established with the state of North Dakota, the University of North Dakota, and LM Wind Power," Thorsteinson said. "We are on a clear path to commercialization."

According to Shroyer, EdgeData's mission to the industries it serves is to build big data applications and, in turn, all of the data that is being produced these days through UAS into usable business intelligence.

"It becomes obvious that inspecting wind turbines from the air is advantageous to wind farm owners and operators and that you can do it more quickly and gather more data that is also more accurate," Shroyer said. "The physical demands of scaling that turbine are also eliminated. There are companies in the industry that are focused on flying drones to inspect the wind turbines. However, the top objection we hear is that they just take thousands of pictures, videos, or 3-D images and the client needs to know how to make that information usable. EdgeData takes all

An example of one of EdgeData's drones.

of that data and turns it into the three or four images that you as an end user need in order to make an informed decision that will bring value to your business."

Shroyer and his team will take that innumerable amount of images or videos captured by UAS and input

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One of EdgeData's drones inspecting a wind turbine.

the data into its innovative software — BladeEdge.

BladeEdge is the first analytical software that transforms raw data from aerial inspections into actionable intelligence, improving wind farm safety and efficiency and ultimately extending infrastructure lifespan and minimizing revenue losses.

Degraded blade condition can lead to a 10- to 25-percent efficiency loss and substantial losses in revenue from faulty components. According to Bloomquist, BladeEdge is a dashboard where wind farm owners or operators will be able to bring other maintenance records into a single portal application and better manage their assets.

"We offer in-depth knowledge of the industry and its components in the field, and we're going to solve the big-data issues by creating automated software that will take all of that

information and break it down into three parts: capture, compute, and consume," Bloomquist said.

The obvious "capture" here is the UAS technology that flies around the turbine to collect data in the form of images and videos as well as GPS information. Shroyer said that BladeEdge is designed to also capture information relating to manufacturing and maintenance processes, creating an entire life-cycle of data.

The "compute" stage consists of stitching images, automatically assessing conditions and computing the data with ROI calculators on how much the leading edge erosion could be affecting the performance output and the total repair costs now versus what they could be in the future should the issues not be addressed.

"The computed data will allow you to make better business decisions regarding maintenance and repairs," Shroyer said.

The last factor is "consume," which Shroyer said means presenting the collected data in a way that will allow you to use it most efficiently. The system is color coded in red, yellow, and green — with red being the most severe and green being the least. BladeEdge also aligns and compares the data it collects with the EPRI blade condition industry standard.

"We'll provide our client with a dashboard presenting the issues in red that should be addressed immediately and could otherwise cause disastrous or costly problems, followed by any in the yellow or green categories, which have a lesser sense of immediacy," Shroyer said. "The client is able to make an informed decision at that point as to where their resources should be invested and which problems should be fixed and when. We'll do a color assessment that will utilize alphanumeric codes to tell you if it's a trailing edge crack or leading edge erosion."

A major aspect of the BladeEdge that sets it and Edge-Data apart from other image-capturing data assessment providers in the industry is that all of this data collection and analysis is done automatically in the software and then presented in the portal rather than being collected manually.

"We're using software development that will turn this into an automated process," Shroyer said. "We're also utilizing machine learning at some layers. So, rather than writing code for each individual step, the computer begins to learn what it's doing and you won't need to tell it every time. The algorithm will be more efficient and in time, more effective than a human."

At this year's AWEA Windpower Conference & Exhibition in New Orleans, EdgeData will demonstrate its BladeEdge analytical software for the first time at Booth #2719, after which the product will be commercially available to the wind energy market.
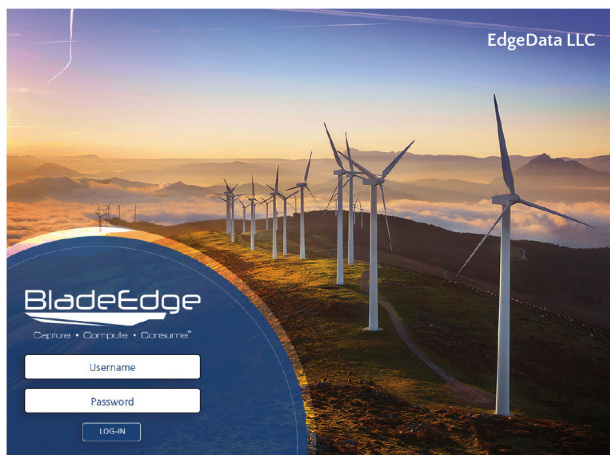
The BladeEdge analysis portal log-in dashboard

An operator controlling a drone during a wind turbine inspection.

"We are currently in our research phase, so we are still flying and funding our flight operations with our research grant, but we'll move into commercial operations at the end of the Windpower show," Bloomquist said. "As we continue to build BladeEdge, it will become a company of its own to address needs specific to the wind energy industry."

EdgeData will also have its UAS airframes that are used to capture images and data on wind turbines as well as a drone that it will be giving away in a prize drawing. To register for the drawing, stop by Booth #2719 or follow @BladeEdgeLLC on Twitter.
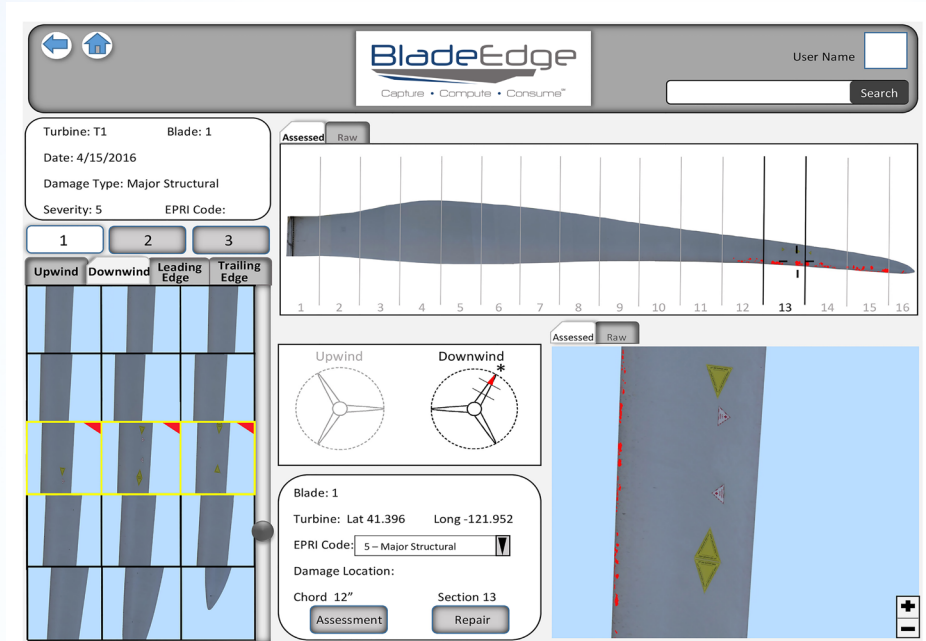
"The BladeEdge analysis portal will be an industry differentiator as we move forward, and it will bring maturity to the wind industry by presenting big data in an easily consumable way," Shroyer said.

For more information, go to
www.edgedata.net and stop by Booth #2719
at the AWEA 2016 Windpower Conference & Exhibition.

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User Name

Search

Turbine: T1   Blade: 1

Date: 4/15/2016

Damage Type: Major Structural

Severity: 5   EPRI Code:

| 1 | 2 | 3 |

Upwind | Downwind | Leading Edge | Trailing Edge

Assessed Raw

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

Assessed Raw

Upwind   Downwind

Blade: 1

Turbine: Lat 41.396   Long -121.952

EPRI Code: 5 – Major Structural

Damage Location:

Chord 12"   Section 13

Assessment   Repair

Leading Edge Business Intelligence

Simplify maintenance planning and extend the life of your wind energy infrastructure with BladeEdge.

◁ Avoid energy loss from leading edge erosion ◁ Efficient automated condition assessments
◁ Lower repair costs ◁ Extend blade life ◁ Protect worker safety
◁ Streamline maintenance planning

BladeEdge.net