

# Intelligent Blade Inspection

Autonomous Drones for Smart Defect Detection and Analytics using Artificial Intelligence



# Blade Inspection Today

High Risk, Long Downtime, Expensive

Current methods of blade inspection are either **limited in scope and precision** (telescope) or involve **high-risk, high-cost approaches** that result in **long downtime** (rope/crane access)



Telescope

Limited scope of inspection



Rope Access

Very dangerous and slow



Crane

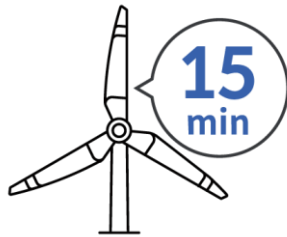
Costly equipment hire

# Here's the Future.

## Autonomous Drones & Smart Analytics with AI

Nearthlab leverages state-of-the-art AI technology with its fleet of autonomously-flying drones to revolutionize blade inspection.

It takes only **15 MINUTES** to inspect one turbine, **1 DAY** to view inspection data, and **1 WEEK** to receive your full inspection analysis report.



600+

PHOTOS  
PER UNIT

5-7m

CONSISTENT  
DISTANCE  
FROM BLADE

0.3mm

MINIMUM  
DETECTABLE  
DEFECT SIZE

45 MEGAPIXEL

HIGH-RESOLUTION  
INSPECTION DATA  
(5 TIMES BETTER THAN 4K VIDEO)

# Faster and Better.

## Comparative Analysis of Inspection Methods

	Inspection Time	Photo Quality	Cost *
Telescope	Short-Mid (6-7 turbines / day)	Low	Low
Rope Access	Long (1-2 turbines / day)	Good but partial	Mid - Expensive
Crane	Long (1-2 turbines / day)	Good but partial	Expensive
Piloted Drone	Short (4-5 turbines / day)	Low - Mid (Inconsistent)	Low - Mid
Autonomous Drone	Very Short (10-12 turbines / day)	Very good	Low

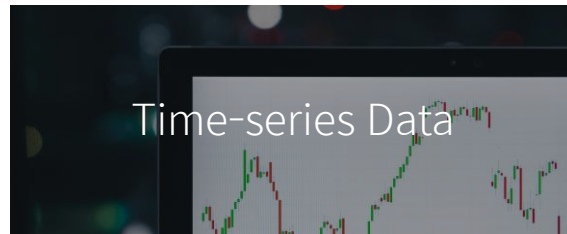
*\* Cost for inspection report not included*

# Make Better Sense of What You See.

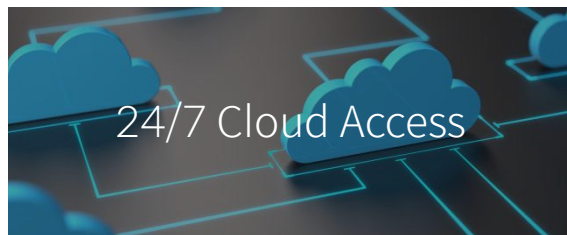
Nearthlab's AI analytics solution allows you to get most out of the quality data collected by autonomous drones.



Nearthlab's Autonomous Drone takes hundreds of photos to cover the entirety of the three blades. This enables detection of even the smallest of defects.



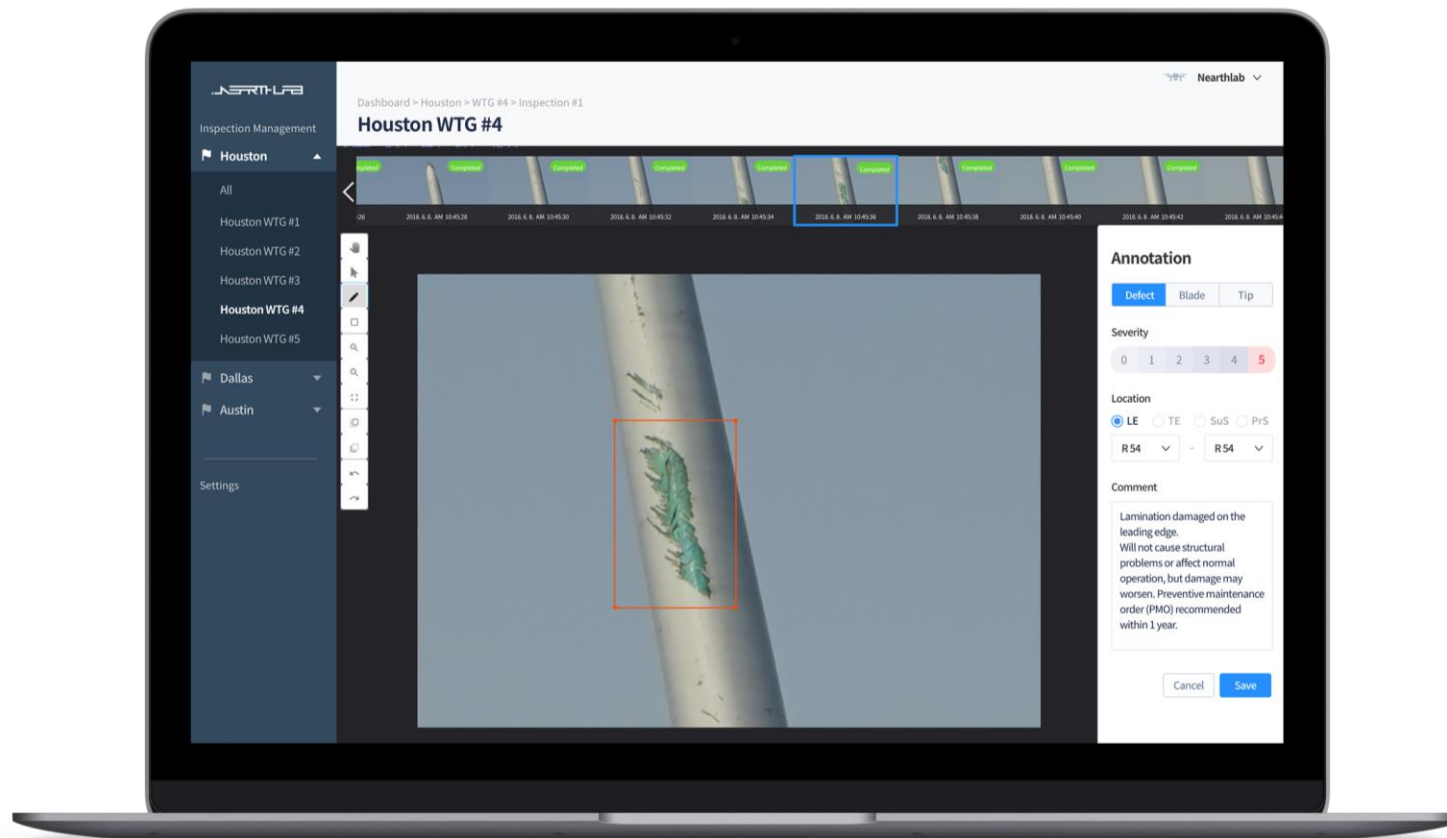
Nearthlab's Diagnostics AI allows in-depth analysis on progression of defects over a long period of time by analyzing data acquired through regular inspection.



Nearthlab's Smart Defect Detection Solution is provided as a cloud service, which allows easy access to inspection data.

# Inspection Data Portal

Nearthlab's proprietary web-based data portal enables efficient management of high-resolution inspection data.





# Blade Inspection Report

Inspection report, including blade experts' diagnosis and recommendations, is automatically generated as a PDF file.



# Case Study: Eurus Energy **Eurus Energy**

Nearthlab has provided inspection service to Taegisan Wind Farm, owned and operated by Eurus Energy, using its autonomous drones.

## 01 Background

Taegisan, located in Gangwon Province, is one of the largest wind farms in Korea with 20 wind turbine generators.

Taegisan previously experimented with piloted drones for blade inspection, but was looking for a better alternative.

## 02 Scope of Nearthlab's Service

Nearthlab provided end-to-end inspection service for Taegisan using its autonomous drones and AI-powered analytics solution.

## 03 Results

Nearthlab was able to successfully fly its drone and capture high-resolution inspection data despite unfavorable conditions such as strong wind and precipitation.

Currently, Eurus Energy and Nearthlab are in talks regarding using Nearthlab's drones for inspection of other wind farms owned by Eurus Energy.





# Global Reach

After official launch in Korea in 2018, Nearthlab is actively looking for new business opportunities abroad.

## 01 Expansion in Asia

Nearthlab is currently expanding its service coverage to other Asian countries such as India, Japan and Mongolia, through collaboration with power companies and wind farm owners in each country.



## 02 Partnership with Onyx Insight APAC

Nearthlab has been partnering with Onyx Insight for joint research in using machine learning to improve accuracy of defect detection algorithm. Results of the research were presented at the 2019 Japan Technical Symposium.



## 03 U.S. Roadshow

After participating in major trade shows in the U.S., including Wind Operations Dallas and AWEA WindPower 2019, Nearthlab will be offering demonstration of its solution or providing service to wind farms in the U.S. in the second half of 2019.



# About Nearthlab

Nearthlab is developing AI-powered O&M solutions that can dramatically increase operational efficiency of wind turbine generators.

Based on the technological expertise of its expert engineers, many of whom hold M.S. and Ph.D. degrees, Nearthlab aims to provide tailored solution to any O&M needs in wind energy industry.

Currently, 70% of Nearthlab's workforce are experienced engineers in the following areas:

- Energy systems engineering
- Computer science
- AI/machine learning
- UAV systems



# Thank you

Nearthlab Inc.

business@nearthlab.com

+1 213 205 0477

[www.nearthlab.com](http://www.nearthlab.com)

5F, 417, Nonhyeon-ro, Gangnam-gu, Seoul, Korea

