Which Durian should be picked? This AI-powered tool will tell

File photo of durian fruits. (Photo from Shutterstock)

The large, spiky, strong-smelling Durian fruit, crowned as the “King of Fruits,” has now met artificial intelligence (AI)—and tells which fruit makes the cut.

With the Philippines annually producing at least 80,000 metric tons of fresh durian and yielding almost PHP 6 billion for its production, catering to both local and global demand, its quality grading should be as sharp as its spikes.

However, choosing the fruit with the best quality relies heavily on traditional manual methods, making its practice subjective to the experience and judgment of the classifiers, particularly in visual observation and acoustic tapping.

To know which is good for the market, a good durian appears to have a moist stem, pliable thorns, and distinct bulges, and when tapped, it should sound like a dull, hollow thump, indicating its ripe flesh separated from the inner shell.

“These methods are subjective and difficult to replicate consistently; grading can vary among classifiers and may become a bottleneck when skilled personnel are limited, particularly during peak handling periods,” Dr. Armacheska M. Satina, the project leader, said.

To ease this woe, Satina and her team from the University of the Philippines - Mindanao (UPMin) developed a modern approach for assessing durian maturity and quality—the AI-based Non-Invasive Grading System for Durian, or the AIDurian.

AIDurian integrates computer-operated visual scanning, acoustic analysis, and deep learning to assess key fruit attributes, including ripeness, surface defects, locule count, and fruit shape, all without damaging the fruit itself.

“It provides a technology-enabled complement or alternative to traditional manual tapping and visual inspection, helping improve the speed and consistency of grading durian,” said Dr. Satina.

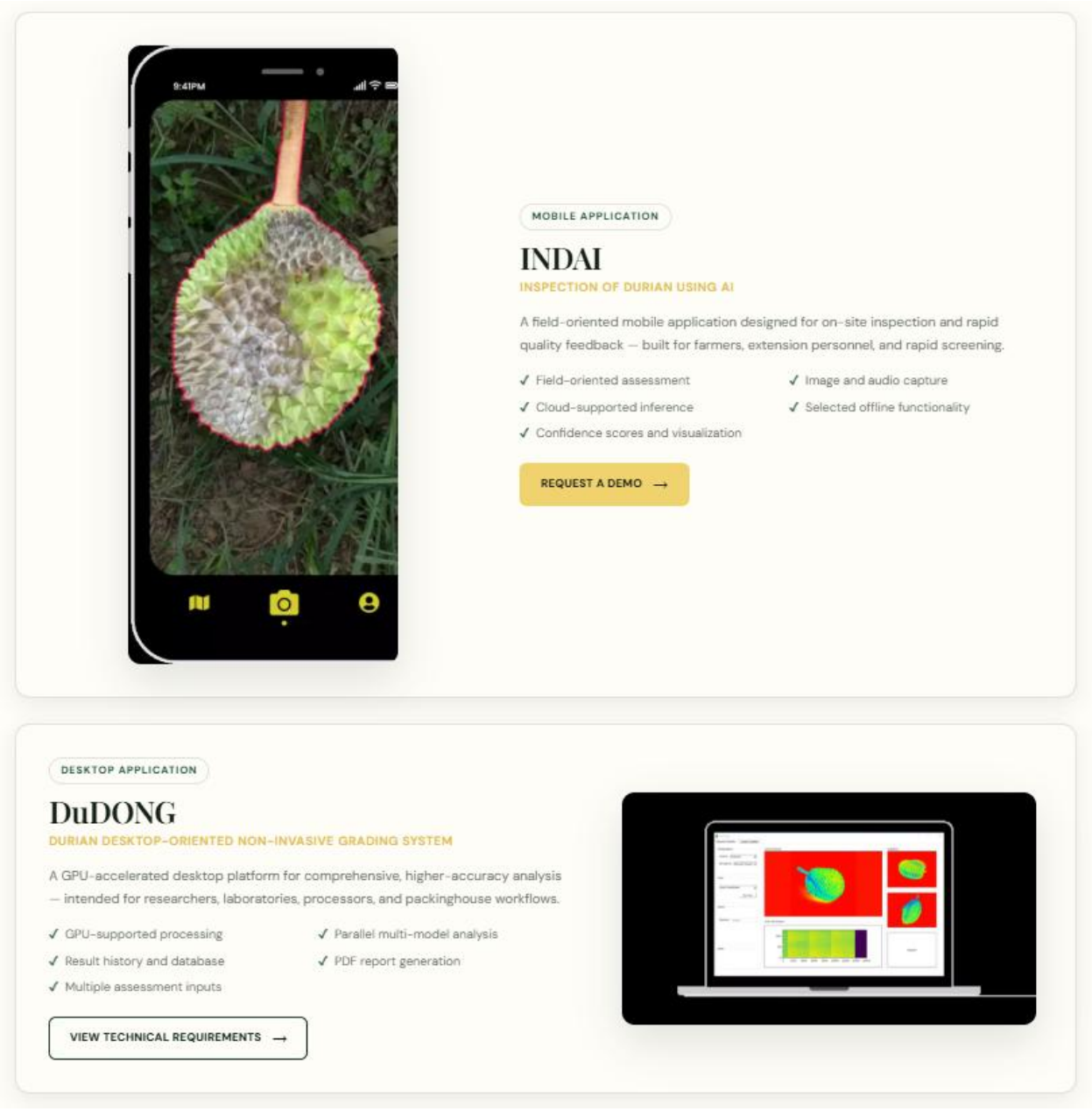
It is integrated into two prototype platforms: Inspection of Durian Using AI (INDAI), a mobile application for field-level inspection and decision support, and Durian Desktop-Oriented Non-Invasive Grading System (DuDONG), a desktop application designed for more comprehensive analysis.

As per its testing, the technology is reported to have a more than 80 percent accuracy rate for its maturity classification and acoustic ripeness, alongside 93 percent defect detection and almost 98 percent locule analysis accuracy rates.

Durian quality inaccuracies are reported to ruin the taste and ripening quality of the fruit and fall short of the export-quality standards, which may cause the above-said losses and income declines for durian farmers, processors, cooperatives, and those involved in the value chain.

“By automating selected grading tasks, AIDurian can help support more timely sorting, handling, and marketing decisions while potentially reducing postharvest losses,” she added.

MEDIA RELEASE



Screenshot of INDAI and DuDONG, the integrated platform of AIDurian. (Photo from AIDurian | Website: *aidurian.pasiclab.live)*

This AI-powered tool is a project implemented by the UPMin under the Department of Science and Technology (DOST) I-CRADLE program with a PHP 11-million budget, completed in early January this year.

With the DOST-Philippine Council for Agriculture, Aquatic, and Natural Resources Research and Development monitoring its implementation, AIDurian also joined forces with various local durian farm cooperatives and other stakeholders in Davao Region.

“AIDurian supports the digital transformation of the durian industry, strengthens local capacity in AI applications for agriculture, and provides a potential pathway toward more standardized and sustainable grading practices,” Satina said.

About NSTW

The AIDurian is one of the highlights of the National Science, Technology, and Innovation Week (NSTW), an annual celebration organized by the Department of Science and Technology (DOST) that highlights the country’s scientific and technological achievements, research and development (R&D) projects, and innovative solutions. The event brings together researchers, innovators, industries, government agencies, the academe, and communities to showcase how science, technology, and innovation (STI) contribute to inclusive, sustainable, and resilient national development. The NSTW serves as a platform for promoting homegrown technologies, strengthening collaboration among STI stakeholders, and bringing science-based solutions closer to Filipinos. This year’s NSTW will be held on November 25–29 in General Santos City, South Cotabato. For more information, visit www.nstw.dost.gov.ph or the NSTW Facebook page. ***(By Karl Jerome M. del Mundo, DOST-STII)***