

CASE STUDY — How a major Australian university has revolutionised its building inspection process



Skand · Fellow
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In 2017, Skand was engaged to help overhaul roof inspection services for one of Australia's largest universities. With a number of campuses located across Melbourne, the client needed to reduce costs and minimise risk, while vastly improving the overall outcome of their building inspection and defect identification process.

■ CASE BACKGROUND

Carrying out regular building inspections can be an enormous cost for an organisation. This is largely because roof and façade inspections are usually conducted manually via roof or rope access. Not only does this present a physical risk to employees and contractors, it's also highly inefficient.

If there are multiple sites and buildings, the results are likely to be inconsistent because multiple people are involved in the inspection process. Documentation can be highly technical, often taking the form of a PDF produced by an engineer. And usually only a fraction of the bigger picture is seen, as the high cost of traditional building inspections makes it an infrequent occurrence, or targeted to specific building features only.

Fortunately, with the use of drone technology, machine learning and Skand's innovative web-based platform, the building inspection process is undergoing transformation.



■ COMBINING DRONE TECHNOLOGY WITH MACHINE LEARNING

Skand worked with a drone service provider to generate 8,500 aerial images of the client's roofs and facades. The data was then duplicated, with one set of images sent to a machine learning platform and the other set sent to Skand's 3D model creation partner Bentley Systems.

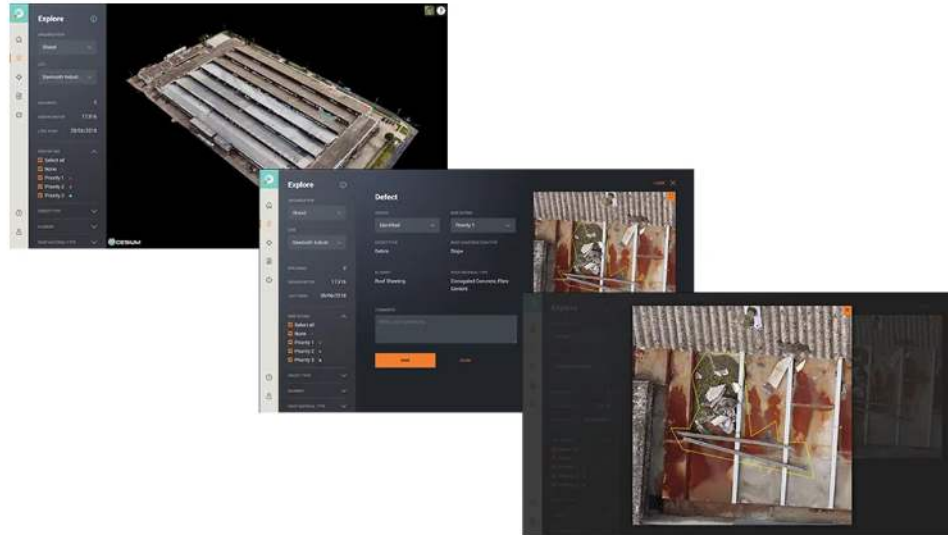
Large buildings with uniform features can make defect detection challenging, so by creating a 3D model of the building, defects can be viewed much more clearly.

Sophisticated machine learning technology trained the software to identify defects, which were then analysed by Skand and pushed through to the client's log in on the web-based app. This meant the client received digital information that was easily accessible across the

business, reducing engineering time and cost, and producing consistent results.

"BY TRAINING A MACHINE TO IDENTIFY DEFECTS AND HAVING A CENTRALISED PRODUCTION TEAM INTERROGATE THE DATA, WE ARE ABLE TO PRODUCE RESULTS THAT ARE CONSISTENT REGARDLESS OF WHICH REGION OR BUILDING WE'RE REPORTING ON. THIS IS A SIGNIFICANT IMPROVEMENT FOR BUSINESSES THAT HAVE ASSET PORTFOLIOS IN MANY COUNTRIES OR ACROSS MULTIPLE LOCATIONS IN AUSTRALIA WHERE CONDITIONS CAN VARY CONSIDERABLY."

Brett Chilton, Skand



■ THE CHALLENGES OF IMAGE CAPTURE

Many of the buildings, particularly ones with lower profiles, were located close to trees, powerlines and neighbouring buildings. This made capturing each site via drone difficult, requiring Skand to develop a new technique for carrying out inspections on buildings lower than five storeys.

Capturing thermal imaging also proved challenging due to the time of year and variable weather conditions in Melbourne. This was, however, resolved, leading to improvements in Skand's workflow that can be used in future.

In addition, an enormous dataset (8,500 images) had to be uploaded through a browser, requiring additional technology to support the size of the upload.

The new method, called Skand Ingest Assist (SIA), uses a number of techniques to allow large datasets to be uploaded without crashing the browser. Side-by-side tests with Dropbox showed that SIA was more effective at uploading image sets above 3,000 images, an exciting development that will greatly increase efficiencies in the data handling process.

■ INCREASING QUALITY AND EFFICIENCY

Overall, the client experienced a vastly improved outcome through their work with Skand:

100%

MAPPING OF ALL CAMPUS BUILDINGS IN BOTH RGB (VISUAL) AND THERMAL SPECTRUMS (ROOF AND FACADES).



A HIGH-RESOLUTION MODEL THAT CAN NOW BE USED AS A BASE FOR FUTURE INSPECTIONS (REDUCING THE NEED FOR



A TIMELINE OF DATA CAPTURE THAT IS EASY TO ACCESS AND COMPARE, ALLOWING DEFECTS TO BE OBSERVED OVER TIME, AND EVIDENCE OF DEFECT REDUCTION READY.

ADDITIONAL DRONE DATA).

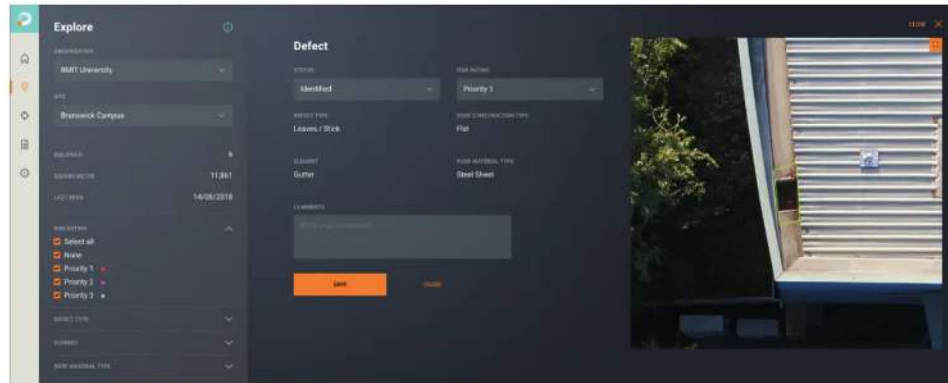
AVAILABLE.

"ONE OF OUR BIGGEST ACHIEVEMENTS WAS IN DEVELOPING THE WORKFLOW FROM START TO FINISH FOR BOTH ROOFS AND FACADES, AND THERMAL AND RGB. WHILE WE KNEW HOW TO DO IT, BRINGING IT TOGETHER FOR THE FIRST TIME AND INTO A NEW PLATFORM WAS A MAJOR ACHIEVEMENT."

Brett Chilton, Skand

■ WHAT'S NEXT?

Skand and the client are continuing to work together to introduce the same service to other campuses in Australia, and potentially overseas.



■ ABOUT US

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To learn more about Skand, visit [our website](#) or please contact us at info@skand.io



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