

# CASE STUDY:

# GEO AI

We helped Thyssenkrupp to improve inefficient, traditional build progress reporting on large industrial construction sites by automating it with GeoAI. Together, we successfully proved a concept that can save them time and money.

Thyssenkrupp Industrial Solutions is a leading partner for the engineering, construction and service of industrial plants and systems, headquartered in Essen, Germany. They're a top-10 by revenue German company, and their global network enables them to supply turn-key plants worldwide that set benchmarks in terms of value-added and resource-friendly technologies.



## 1 - CHALLENGE

Thyssenkrupp Industrial Solution's Construction Management Department creates progress reports of Thyssenkrupp's construction sites on a regular basis: every 1 to 4-weeks. The actual status of concrete and steel works must be reported as well as the erection progress of mechanical equipment. Actual quantities are reckoned visually by site supervisors or evaluated by delivery lists. Those quantities are compared to planned values of the construction schedule. The process is time-consuming and inaccurate. Thyssenkrupp wanted a quicker, innovative and more accurate way to measure build progress.



## 3 - RESULTS

Orbica's deep learning algorithm successfully extracted and classified concrete, scaffold and steel bars from the drone imagery supplied. We achieved 93.61% training accuracy and 90.82% testing accuracy on the data supplied by Thyssenkrupp. This will only increase over time as the algorithm consumes more data. It takes five hours to train a data set and just 10 minutes for predictions. This successfully proves a future-forward way that Thyssenkrupp can save time and resource, and improve accuracy and regularity, using GeoAI.



## 2 - SOLUTION

Orbica won the Thyssenkrupp Industrial Solutions Drone Analytics Challenge and People's Choice award at Beyond Conventions, Germany, in February 2018 with its proposal to automate build progress reporting using GeoAI. GeoAI is a combination of artificial intelligence deep learning algorithms and geoprocessing that automates feature extraction and classification from imagery. Thyssenkrupp provided drone imagery of its large construction site in Saudi Arabia, from which we created a point cloud model. We then used our GeoAI deep learning algorithm to detect built features such as concrete, scaffold and steel bars. The concept is that results can be compared to previous results to determine progress.

