

Steel Pipe Character Identification



Client

Our client is a multinational steel manufacturing corporation headquartered in Luxembourg City. With more than 2, 00,000 employees, our client is one of the world's largest steel producers, with an annual crude steel production of 92.5 million metric tonnes as of 2018. They are ranked 123rd in the 2017 Fortune Global 500 ranking of the world's largest corporations.

Problem Faced

- Inspection of the printed character on a steel pipe rolling on a rotatory bench was a strenuous task with minimal accuracy since there was human involvement.
- Another major issue was with the time constraints. Since everything was done here manually, the time consumption was way too high.

Technology introduced by Qualitas Technologies



Artificial Intelligence and Deep Neural Network which helps in optimal decision making and generating accurate results of Image processing. Compared to traditional OCR algorithms, AI-based OCR is far more accurate, resulting in 100% accuracy. In OCR application, the type of printed character may vary in many aspects (Size, aspect ratio, contrast, brightness). Conventional image processing may fail in identifying the character slightly different from the trained set. Whereas AI-based software solves this problem by providing image augmentation wherein we can set different thresholds for image parameters.



Solution

- A high-resolution area scan camera fitted with the lens was placed under the rolling machine looking upwards to capture the image of characters on steel pipe.
- Working distance of the camera was adjusted and fixed to achieve the required depth of field of 14 inch and to cover the required FOV.
- Also, a suitable high intensity integrated industrial LED ring light was introduced, which ensured the proper illumination of the required ROI.
- The trigger was generated for the camera to capture the OCR on a steel pipe using BLOB Detection.
- These images were then processed by the AI-based software in a separate processing unit to look for the characters. Based on the extracted features, the results were obtained (OK/NOT OK).
- The identified OCR was displayed in the customized UI developed by Qualitas.

Images


Captured Image	Annotated Image
	

Results

The proposed solution works for all the trained OCR characters.

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