CASE STUDY

AI & ML Base Laser Inspection ATE

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Clientele

Our client, a major integrated steel plant, faces challenges with manual surface inspection of steel plates at the New Plate Mill (NPM), RSP. This process is time-consuming, error-prone, and lacks timely feedback for defect containment. To address this, our client plan to introduce a laser-based 3D camera system for automated defect identification, enhancing efficiency and accuracy.

Dilemma encountered

- Hazardous environments pose challenges for inspectors due to limited visibility and terrain obstacles.
- Manual inspection in hazardous areas is inefficient, requiring significant time and manpower.
- Current data systems lack efficiency in hazardous environments, hindering inspection processes.

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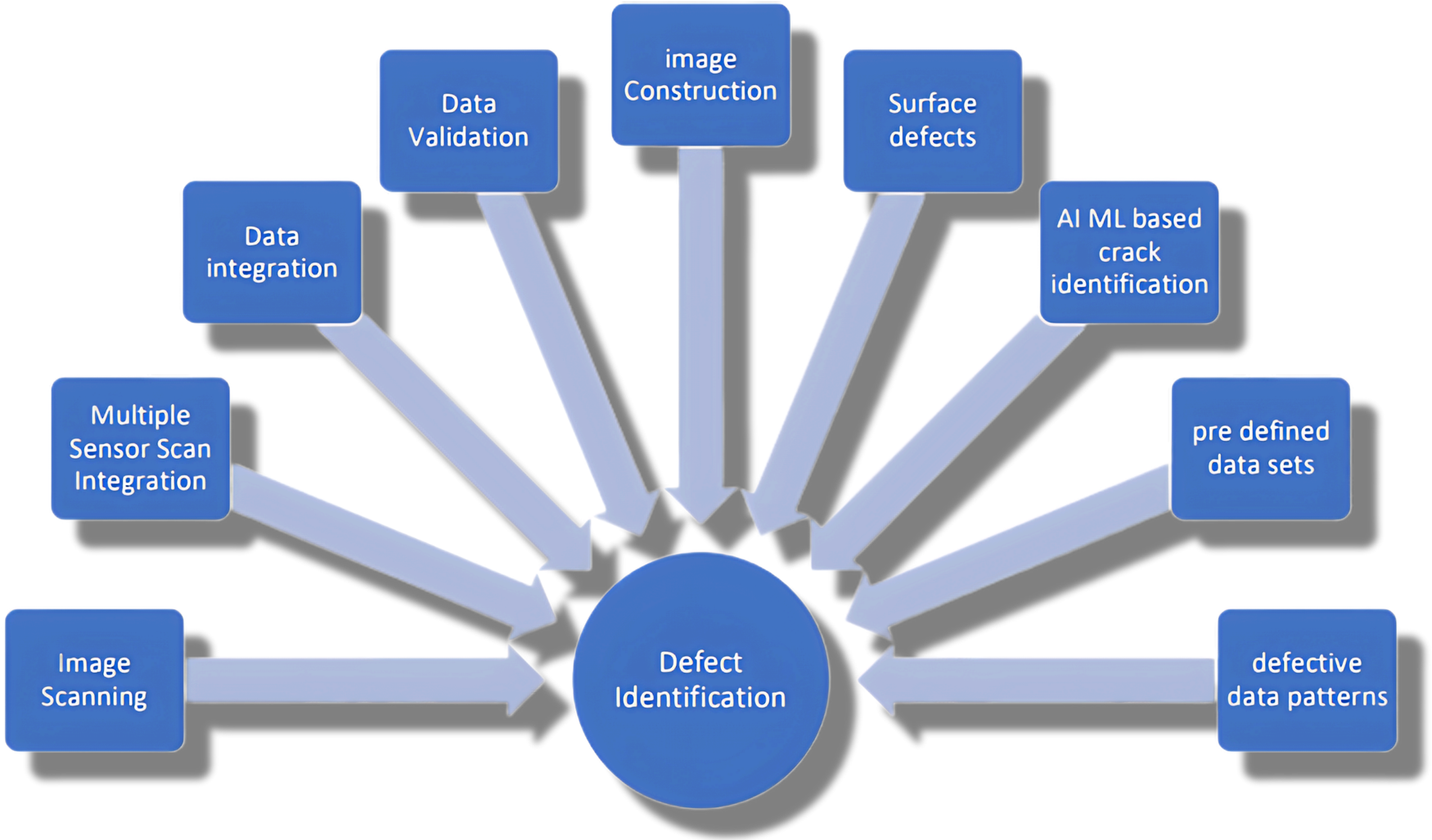
Fix proposed

- Utilization of advanced laser-based 3D cameras for precise surface defect identification.
- Comprehensive data acquisition system consisting of a Workstation, Gigabit Network, and Human-Machine Interface (HMI).
- Integration of an AI-ML-based Defect Identification Program for automatic and continuous detection of surface defects on hot steel plates.
- Elimination of the need for human intervention in the surface defect detection process.



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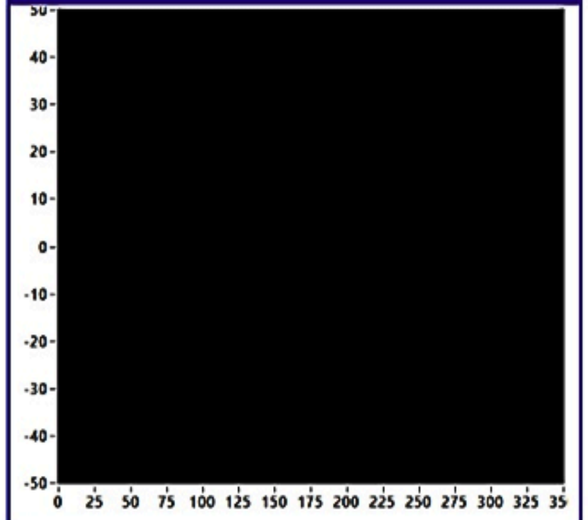
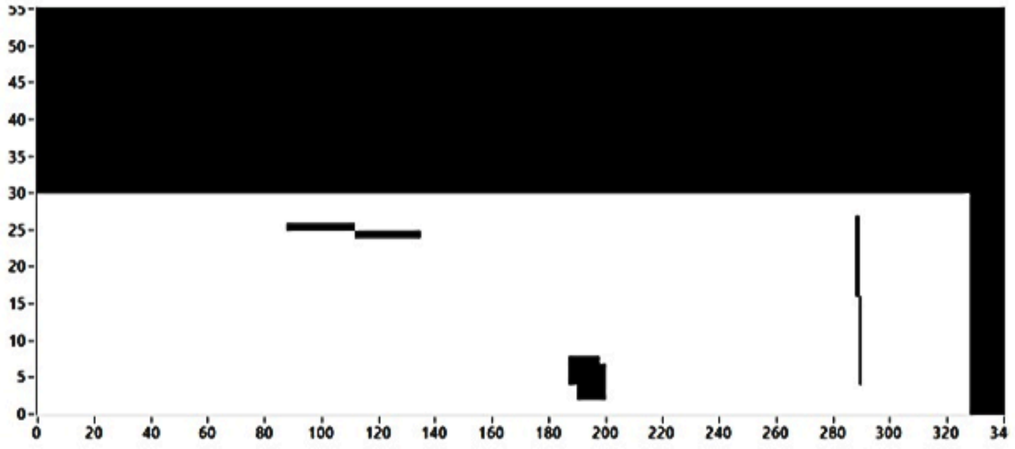
STEEL CRACK IDENTIFICATION SYSTEM

LIVE CAM

LIVE PROFILER - SHERLOCK



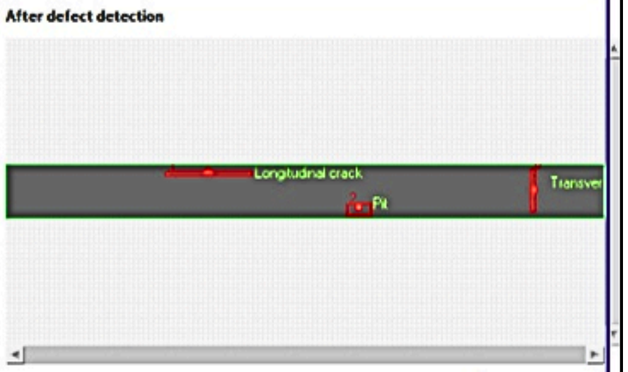
CRACK INTENSITY/DEPTH ANALYSIS



CRACK INTENSITY/DEPTH ANALYSIS

PIT			TRANSVERSE CRACK			LONGITUDINAL CRACK		
Object Center		Bounding Box	Object Center		Bounding Box	Object Center		Bounding Box
X	193.417	X Left 187	X	288.522	X Left 288	X	111	X Left 88
Y	24.3333	Y Top 22	Y	14	Y Top 3	Y	4.48936	Y Top 4
Area	72	X Right 200	Area	23	X Right 290	Area	47	X Right 135
Orientation	174.921	Y Bottom 28	Orientation	93.7367	Y Bottom 26	Orientation	178.171	Y Bottom 6
Aspect Ratio	2.16667		Aspect Ratio	0.0869565		Aspect Ratio	23.5	
Nb Holes	0		Nb Holes	0		Nb Holes	0	

PROCESSED DEPTH



Number of Defects: 3

CRACK DETAILS

	Transver	Longi	Pit		
Center of Mass X	701	294	483		
Center of Mass Y	231	181	299		
First Pixel X	699	241	468		
First Pixel Y	170	176	283		
Bound Rect Left	699	241	468		
Bound Rect Top	170	176	283		
Bound Rect Right	704	349	498		
Bound Rect Bottom	306	188	318		
Max Feret Diameter Start X	699	241	468		
Max Feret Diameter Start Y	170	176	283		
Max Feret Diameter End X	704	349	498		
Max Feret Diameter End Y	306	188	318		
MAx Horizontal Segment Length Left	699	241	468		
MAx Horizontal Segment Length Right	701	295	497		
MAx Horizontal Segment Length Row	170	176	288		
Bounding Rect Width	5	108	30		
Bounding Rect Height	136	12	35		
Bounding Rect Diagonal	136	109	46		

STOP

POWERED BY ELECTRONO

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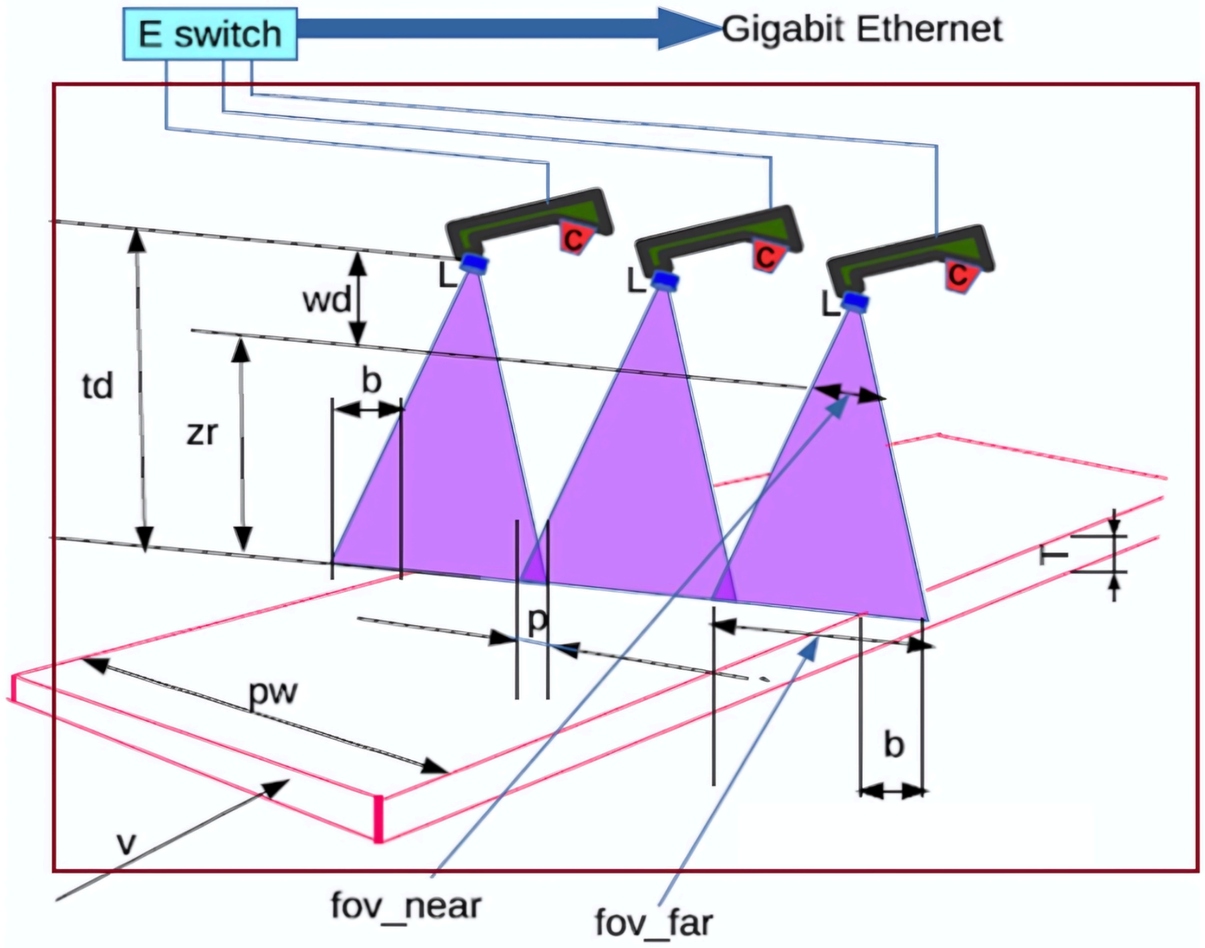

Key Features

- Extremely clear and sharp images using advanced cooled thermal imaging technology.
- The process of detection of surface defects is automatic and continuous without any human intervention.
- Any number of different products can be configured and stored directly by the user.
- Provision for checking the history data
- Calibration window for further alteration of tolerances
- Tolerances for the acceptance and rejection criteria can be set and saved in the database.
- Operator friendly user interface displays the images of steel plates as they are passing through the conveyor belt with identified defects.

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Defect Detection

01

Longitudinal Crack
Dimensions:5mmX500mm
Thickness: 12mm

02

Transverse Crack
Dimensions:5mmX500mm
Thickness: 10mm

03

Pit
Dimensions:5mmX500mm
Thickness: 16mm

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Get In Touch

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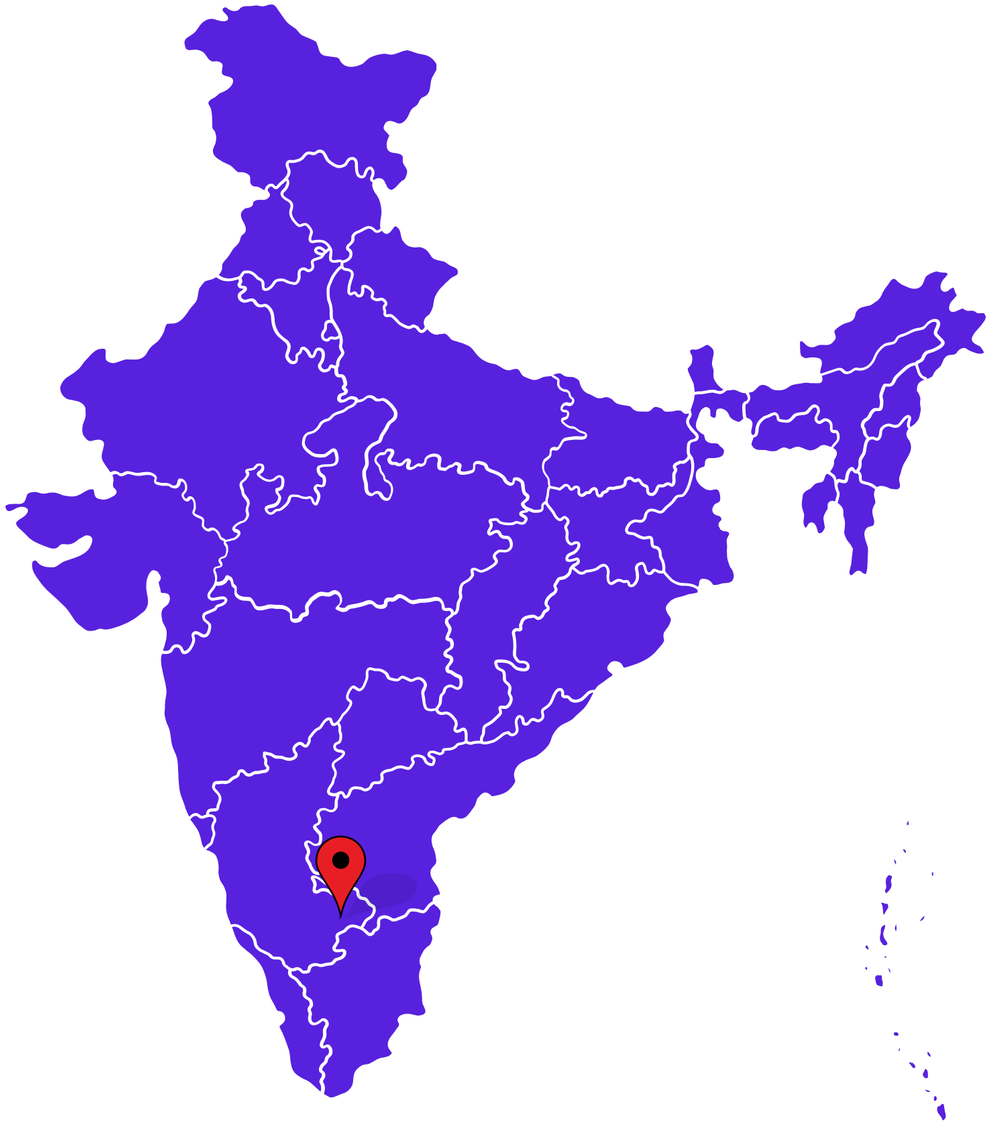

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