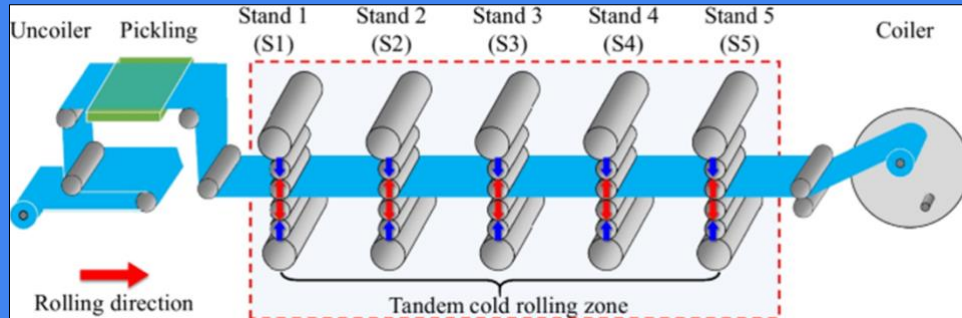


## PROJECT CASE STUDY

### Strip Break Classification in Steel Cold Rolling Using Operational AI



#### PROJECT LEAD

Falkonry

#### PROJECT TEAM

Arcelor Mittal

#### PROJECT OBJECTIVE

The project objective is to demonstrate an automated metal strip break classification system that is capable of predicting the reason for a 'strip break' event.

[MORE ON CESMII.ORG](https://www.cesmii.org)

## Artificial Intelligence Tools Reduce Costly Faults in Steel Production

#### BENEFITS TO OUR NATION

Implementing operational AI tools for strip break classification will enhance the efficiency and reliability of the steel production process by swiftly detecting and classifying breaks in near real-time. This will minimize production downtime and reduce scrap and other production losses. With fewer interruptions and increased productivity, American steel manufacturers can meet demand more effectively with lower cost, higher quality product. Implementing these Smart Manufacturing tools not only streamlines operations but also fosters a more resilient and technologically advanced steel manufacturing sector.

#### BENEFITS TO INDUSTRY

By swiftly and accurately identifying breakages in steel strips, this technology reduces production interruptions, enhances efficiency, and ultimately leads to improved productivity and cost savings. The real-time monitoring and predictive capabilities of AI improve overall quality control, ensuring that American steel sets the global standard for quality. This not only boosts profitability but also secures the industry's role as a key player in domestic and global markets. Embracing AI in steel manufacturing paves the way for a more efficient, sustainable, and prosperous future for American steel manufacturers.

# PROJECT DESCRIPTION

## TECHNICAL APPROACH

Develop the digital twins to detect and classify strip breaks using the Falkonry Operational AI platform by analysing historical and real time data. Tune the digital twins using semi-supervised reinforcement learning and validate the solution to monitor and classify in near real-time conditions.

## ACCOMPLISHMENTS

- Completed digital twin baselining from historical data that was collected to classify normal and strip break behaviours.
- Created cold rolling mill operational data dashboards.
- Operationalized digital twin that continuously monitors and classifies strip breaks in real time.
- Developed complete documentation package for strip break classification solution performance.
- Published Technical Paper:  
Automated and Scalable Strip Break Classification in Tandem Cold Rolling Mills Using Time Series AI, Mehta & Chukwulebe, AIST Digital Transformation Forum, March 2023

## DELIVERABLES

- Delivered Metal Strip / Weld Break SM Profile.
- Delivered Classification Solution Performance Report.
- Published Use Case:  
Strip Break Classification in a Cold Rolling Steel Mill Using Machine Learning.

## REUSABLE OUTCOMES / SM MARKETPLACE

- Metal Strip / Weld Break SM Profile.

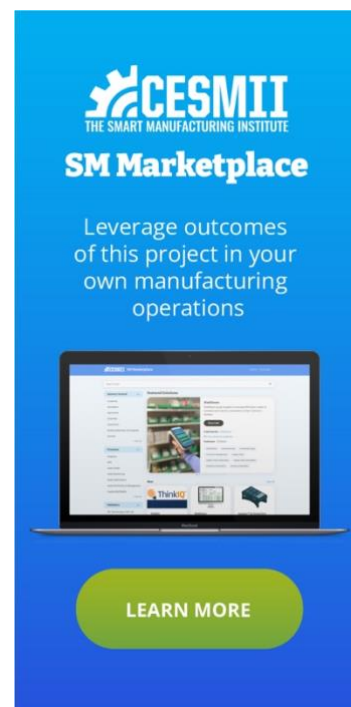
# RESULTS

↓ 94%

94% reduction in time required to classify and analyse strip breaks.

↑ \$40k

Reduction in time required for a Process Engineer to manually measure, analyse and classify strip breaks will improve personnel productivity by \$40K annually per cold rolling line.



The banner features the CESMII logo (The Smart Manufacturing Institute) at the top. Below it, the text 'SM Marketplace' is prominently displayed. A sub-headline reads: 'Leverage outcomes of this project in your own manufacturing operations'. In the center, there is an image of a laptop displaying a web interface with various charts and data. At the bottom, a green button with the text 'LEARN MORE' is visible.

## PROJECT DETAIL

Budget Period: BP5  
Submission Date: 2/22/2023  
Sub-Award (contract) Number:  
4550 G LA048  
SOP: 2345

## FOR MORE INFORMATION CONTACT

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