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A customizable robotic for maintaining the ladle sliding gate

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This paper presents a robotic cell specifically designed for steel shop operations, assisting operators in the inspection, cleaning, and replacement of refractory components in the ladle sliding gate. This critical system enables the controlled opening of the ladle bottom, allowing molten steel to flow into the tundish of the continuous caster.

The developed robotic cell represents an innovative approach to creating a collaborative environment, where technicians and robots interact in a safe and ergonomic manner. The system automates the most strenuous and hazardous tasks, while enhancing the operators' ability to monitor and control the entire process through an advanced vision system and smart human-machine interface.

Successfully installed and tested in an Italian integrated steelworks, this solution improves worker health and safety, while ensuring higher operational quality, precision, and repeatability compared to traditional manual procedures.

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