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## Safer Electric Melting: How robotics is transforming the EAF steel production

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This paper presents a novel robotic approach to enhancing safety and efficiency in steel plant operations, focusing on steel sampling, deslagging, inspection, and automatic ignition systems for Electric Arc Furnaces (EAFs). Designed for harsh industrial environments, these smart robotic solutions significantly reduce human exposure, improve operational accuracy, and increase productivity.

Equipped with multi-tool capabilities, high-speed precision robots offer flexibility for both greenfield and brownfield installations, ensuring seamless integration into existing workflows. The inclusion of an automatic ignition system further enhances process efficiency by enabling precise, reliable ignition without manual intervention.

These customized robotic systems support the digital transformation of steel production, aligning with Industry 4.0 principles. By shifting operational roles from manual execution to supervisory control, they contribute to a safer, more efficient, and highly competitive steelmaking process.

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