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Intelligent Scrap Yard Mapping and Sorting with Vision Systems for Process Optimization

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Efficient management of the scrapyard is essential to improve steelmaking productivity, yet visual mapping and material classification often remain manual and error-prone. This paper presents new solutions developed by Polytec that combine advanced vision systems, AI-driven analytics, and robotic automation to map, classify, and sort scrap materials in real time. The systems integrate high-resolution imaging, spectral analysis, and deep-learning models to identify scrap composition and contamination, enabling automated purification and targeted material handling.
Furthermore, by generating a dynamic digital twin of the scrapyard, the platform ensures accurate material tracking, optimized charge preparation, and improved process traceability from yard to furnace.
Case studies will demonstrate how AI-powered vision and robotics can transform scrapyard operations into a connected, data-driven environment, delivering measurable gains in melt shop performance, quality control, and environmental efficiency.

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