

Description of the result

For sorting used refractory bricks, a system of three different optical sensors is used to classify each brick. AI-based algorithms firstly control the operation of one sensor depending on the data of others and secondly combine the data of all sensors to determine the right material class for each piece of refractory.

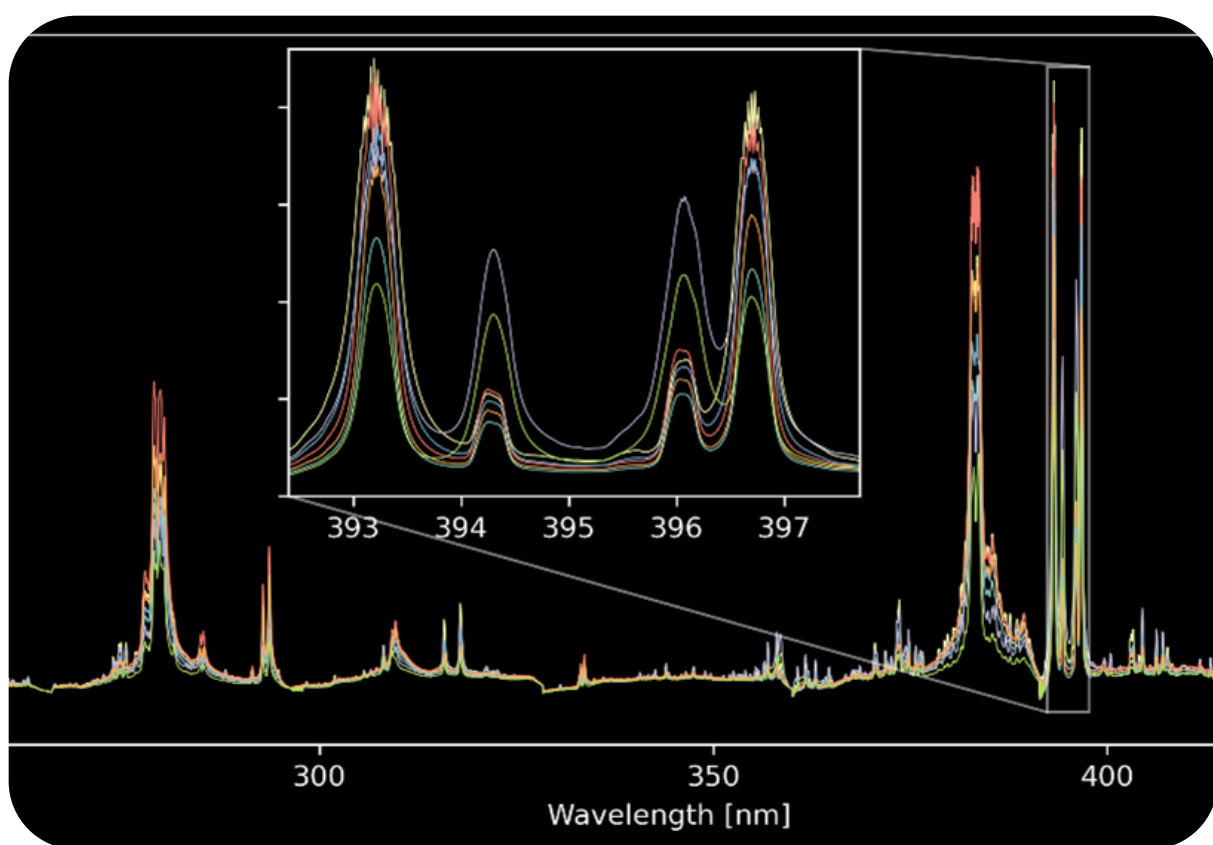


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Problem addressed

High-purity refractory sorting faces a limitation: no single sensor can capture all necessary material properties. The process demands simultaneous analysis of shape, contaminations, mineralogy, and chemistry — requiring multiple specialized sensors and complex data fusion. Coordinating targeted elemental analysis with broader area mapping creates bottlenecks in processing speed and decision accuracy.



Main features & benefits

Combining the data prior to the material classification step generates a complex data set from which AI-based evaluation methods achieve improved results compared to individual evaluation, identifying patterns and correlations in changing material streams. The high variability of feedstock material is a challenge for sensor training, which is largely facilitated and accelerated by the use of machine learning.

Contact & Further Information

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Target users /stakeholders

In the first place, the developed combination will be employed as integral part of sorting systems for used refractory. It allows the identification of a wide range of materials and contaminations and ensures a high-quality sorting output.



Who Is Leading the Development?



Exploitation potential

The use cases for the system will be extended to other types of material, including primary raw minerals and complex waste streams which are challenging for characterisation and sorting today.



Technical facts

The modular design comprises 3D shape recognition, broadband hyper-spectral imaging and targeted high-resolution LIBS analysis. Data from individual sensors with specific pre-processing is combined in real-time for optimized operation and decision making. It can be extended to include other types of sensors, depending on the needs of future application cases.



Scan to learn more about AI for classification for LIBS data

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