AI-BASED ONLINE SPECTRAL CLASSIFICATION OF COPPER ALLOYS USING PGNAA Gözde Özden^b Markus Lange-Hegermann^a Helmand Shayan^a Jan Lorenzen^a ^aInstitute Industrial IT, OWL University of Applied Sciences and Arts, Lemgo, Germany





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- (1) The scrap is irradiated with a beam of neutrons. (2) Through nuclear reaction, the material emits prompt gamma rays, which are measured with a gamma ray spectrometer.
- (3) The data of measured gamma spectra can be saved/visualized and
- (4) classified using an algorithm.
- (5) After classification, the material can be recycled purposefully.

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- The challenge of real-time classification is the noisy short-time measurement.
- We used three classification methods (NN, CNN, Maximum log-likelihood), and the best result was obtained with Maximum log-likelihood.
- We can classify mixtures of copper alloys nearly perfectly in less than one second.



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