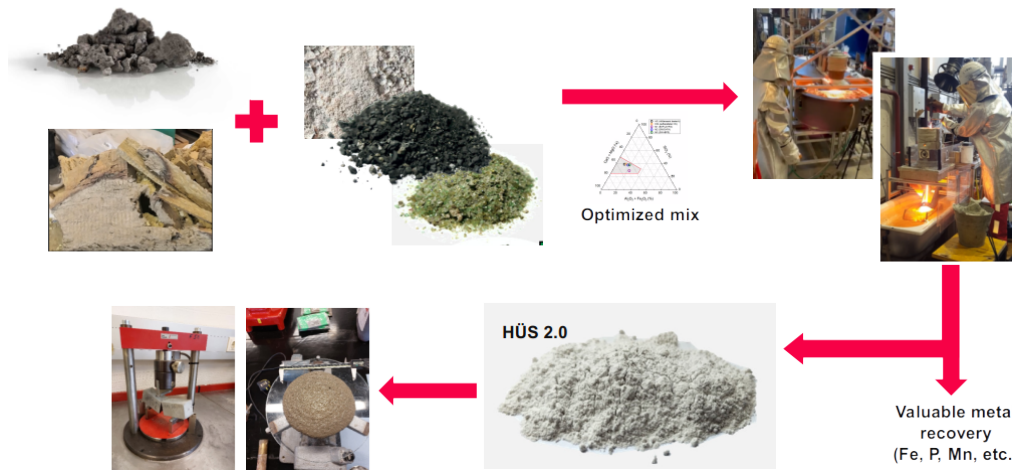# Predicting Reactivity of Innovative Slag-Based SCMs Using Machine Learning

The thesis aims to develop and validate machine learning models capable of predicting the reactivity of innovative, novel slag-based supplementary cementitious materials (SCMs) from their production (melting) parameters, as well as their chemical and mineralogical characteristics. The study will combine data-driven modeling with given materials characterization to establish quantitative structure–reactivity relationships for sustainable binder design and mix optimization.

The project will be carried out in collaboration with Institute of Material Testing and Building Materials Technology (IMBT-TVFA), and Chair of Thermal Processing Technology at Technical University of Leoben.

Goals & Tasks

- *Data collection and preprocessing*: Compile and harmonize datasets linking slag production parameters, chemical / mineralogical composition, and measured reactivity indicators.

- *Model development*: Train and evaluate machine learning models for reactivity prediction.

- *Feature interpretation*: Identify key process and compositional parameters controlling slag reactivity using explainable AI (XAI) methods.

Qualifications

- Interest in interdisciplinary work.

- Experience with data science and machine learning.

- Registered to one of the following:

    - ☐ **Bachelor Thesis**
    - ✓ **Seminar Project**
    - ✓ **Master Thesis**

Contact

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