

## Representation Learning for Classification of Concrete Crack Images

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### ABSTRACT

This study introduces a novel machine learning framework for the classification of concrete crack images (Fig. 1), which diverges from conventional image classification methods. Employing a self-supervised learning approach (Lee et al. 2022), latent vectors of the images are extracted via an autoencoder structure (Chow et al. 2020). This structure integrates an encoder, which compresses the image information, and a decoder, which reconstructs the image. A multi-layer perceptron (MLP) is subsequently trained using these latent vectors as input, with the aim of detecting the presence or absence of cracks (Lee et al. 2023). The performance of the MLP is rigorously evaluated using a confusion matrix, focusing on metrics of accuracy and loss function, to assess the effectiveness of the proposed method.

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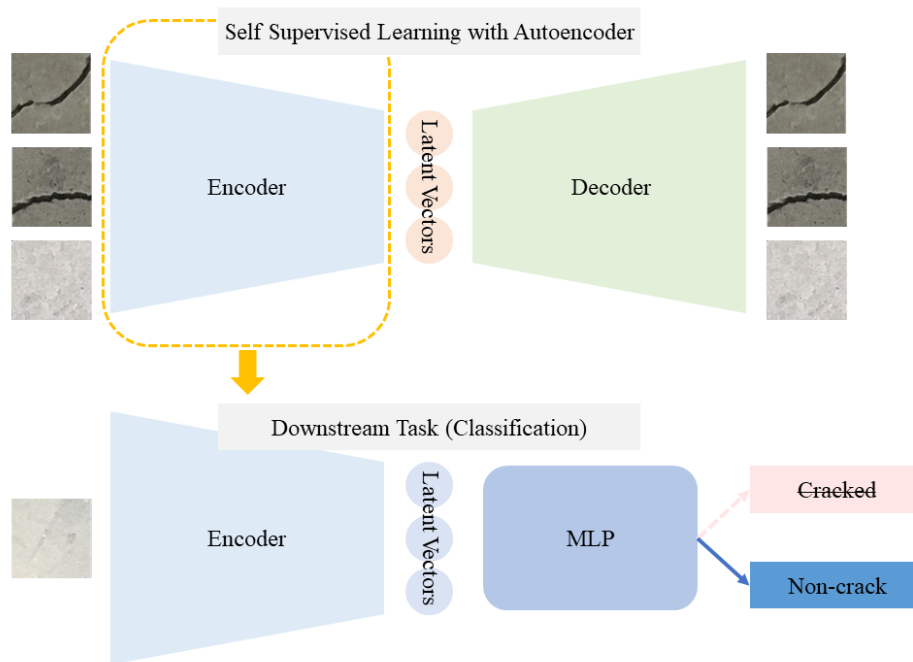


Fig. 1 Model architecture overview

## REFERENCES

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