Masterarbeit zu vergeben

Pattern Mixing for Data Generation of Overlapping and Developing Faults in the Railway Track

Pattern Mixing für Datengenerierung von überlappenden und sich entwickelnden Fehlern im Eisenbahngleis

Collecting large, labelled and balanced fault datasets in the railway sector is especially challenging. This situation is even more critical for the case of overlapping and developing track defects, which are particularly difficult to detect in the practice.

The objective of this work is the application of pattern mixing methods, for instance Synthetic Minority Over-Sampling Technique (SMOTE), for the generation and data augmentation of patterns of track overlapping and developing faults. SMOTE is a commonly employed algorithm for minority class oversampling that bases on a convex interpolation of patterns to randomly generate new samples from the nearest neighbourhood of a reference class. By mixing patterns of different fault classes, overlapping and developing fault samples can be obtained. In the context of this work, patterns of overlapping geometrical Track Irregularities (TI) and local instabilities in developing stage are of particular interest. This work must take advantage of the scheme for data augmentation of TI and track defects based on Generative Adversarial Networks (GAN) developed in previous works.

Synthetic Minority Oversampling Technique

Original Dataset   Generating Samples   Resampled Dataset
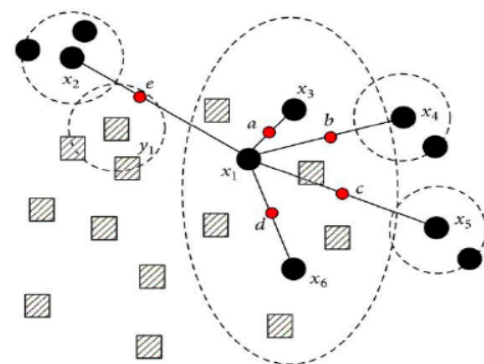
Majority class samples
Minority class samples
Synthetic samples

Bei Interesse wenden Sie sich bitte an:

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