

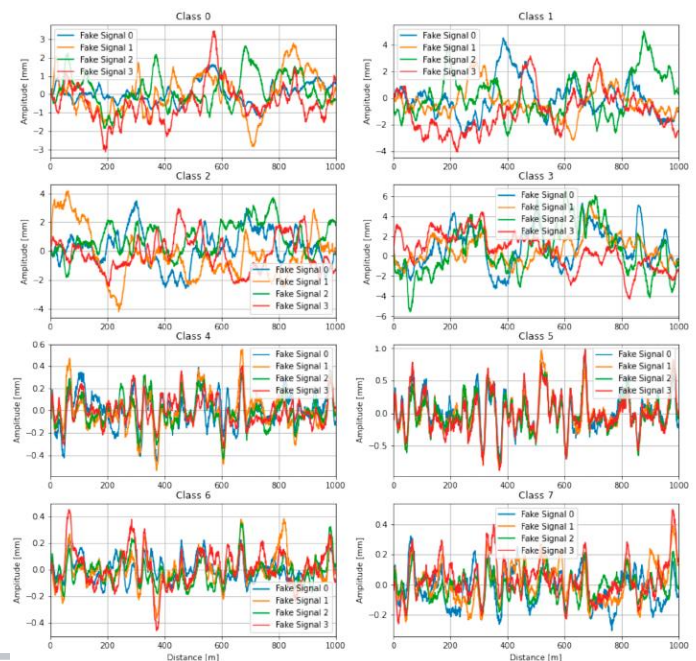
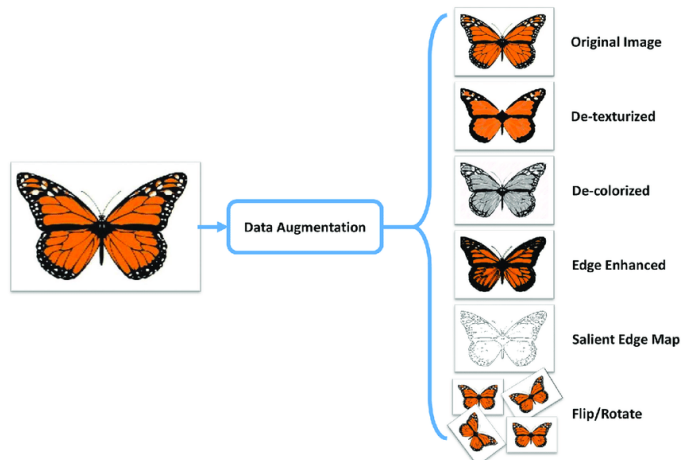
## Masterarbeit zu vergeben

# Data Augmentation in Laboratory Vehicle-Track Model for Fault Classification Performance Improvement of Machine Learning Algorithms

## Data Augmentation im Laborfahrzeug-Fahrweg-Modell zur Verbesserung der Fehlerklassifizierungsleistung von Machine Learning Algorithmen

Machine Learning (ML) algorithms are data-driven, which means that their efficiency and capabilities depend on the quantity and quality of the available data. However, there are still applications where it is difficult, not affordable or even impossible to gather data. For railways, collecting large, labelled and balanced, real fault data sets is particularly difficult. A solution to the issues of data sparsity is the data augmentation approach, where synthetic data is generated from just a few instances of information, increasing the amount of available, useful training examples.

The objective of this work is the modification of an existing Generator of Track Irregularities implemented using a Conditional Generative Adversarial Networks (CGAN) to synthesize artificial data for a down-scaled vehicle-track interaction model. This to produce a large, rich and balanced dataset of structural faults on the railway track, which may be suitable for FDI applications using supervised learning algorithms



Bei Interesse wenden Sie sich bitte an:  
 Héctor Alberto Fernández Bobadilla, M.Eng.  
 Institut für Eisenbahn- und Verkehrswesen, Pfaffenwaldring 7, 70569 Stuttgart  
 Telefon: 0711 685-69255 , [hector.fernandez@ievwwi.uni-stuttgart.de](mailto:hector.fernandez@ievwwi.uni-stuttgart.de)