RTEL
Cognitive Rail Track Error Learning Methods For Railway Maintenance Support

Pro²Future

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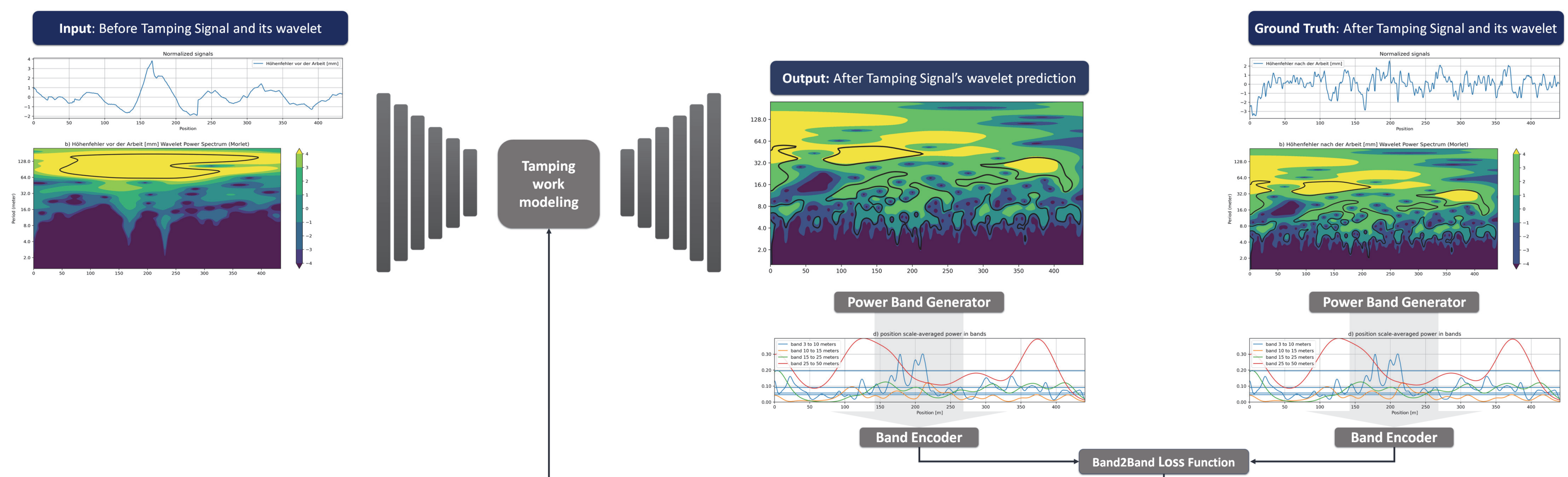[2] Science Park 3, Altenberger Strasse 69, 4040 Linz

MOTIVATION & GOALS

The goal of this project is to **spot anomalies** in railway tracks, **provide online information** to the operator, **assess the tamping work** in dealing with track errors, and **recommend maintenance actions**. RTEL aims to study signals before tamping and while tamping from System 7 machines sensors, i.e., the hydraulic unit, and will develop the anomaly detection mechanisms to predict and generate suggestions for further correction in a railroad. Additionally, knowing failures in the track infrastructure helps with assessing maintenance work and formulating machine behavior in addressing rail track failures.

- Anomaly detection in the signals before and after tamping using wavelet analysis
- Tamping work modelling and evaluation

Project FactBox

Project Name	RTEL
Project ID	MFP II 1.2
Duration	36 Months

Area 1
Perception and Aware Systems

Project Lead
Dr. Michael Haslgrübler

APPROACH

The approach in the RTEL project is to build an AI system upon tamping machines sensory data that spots the position of the error on the railroad using signal processing, learns tamping patterns, compresses, and reconstructs them, models tamping machine behavior, and predicts after tamping signals. Therefore, RTEL will find failures, locate and plot them, predict how they will be addressed, and evaluate the tamping work.

CONTRIBUTION

Scientific contribution
- Wavelet-based anomaly detection model
- Tamping Work Modelling and Evaluation
- Tamping Work Informed Neural Network

Economic contribution
- Railway Maintenance Cost Reduction
- Railway Maintenance Quality Improvement
- Operator and Decision Maker Support
- Data-Driven Business Model

SYSTEM ARCHITECTURE