Railway track fault detection

with Artificial Intelligence

Tamás Demus

2023.07.18

Motivation

Motivation

Interest in railway technology

Desire for research

Self education

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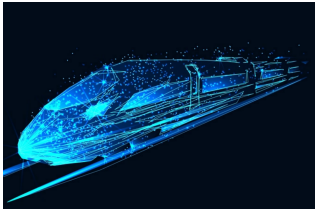


Interest in computer science

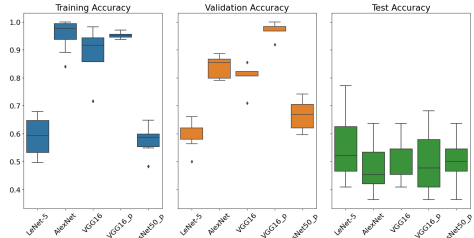
AI studies

Available results

Available results

Modelling practice

- Kaggle dataset
- Deep neural network
- Limited data quality and quantity



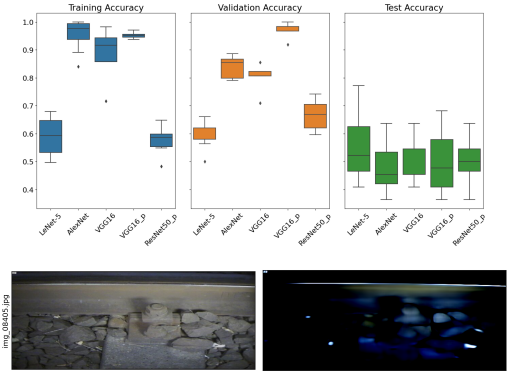
Available results

Modelling practice

- Kaggle dataset
- Deep neural network
- Limited data quality and quantity

Thesis work

- Dataset from MÁV CRTI Ltd.
- Reconstruction of rail images
- Anomaly detection models



Available results

Normal rail

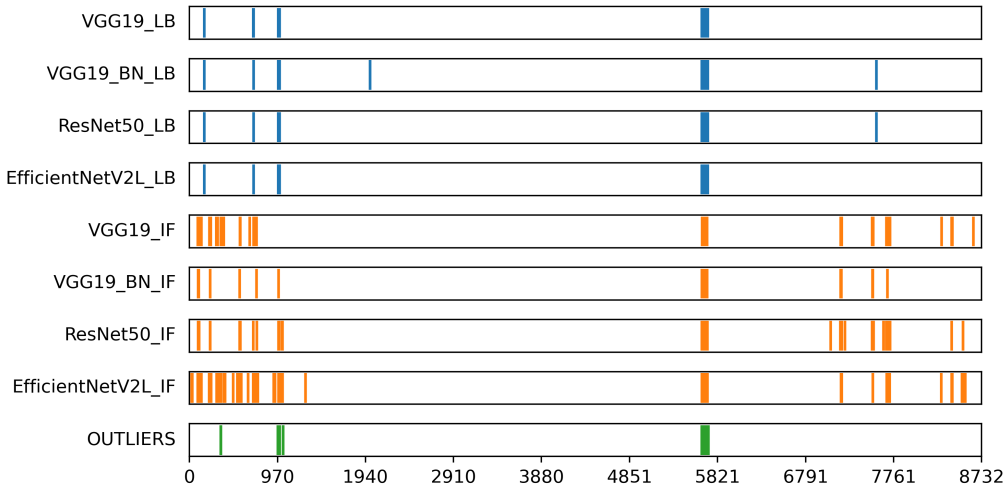
Normal rail

Normal rail

Rails covered with grass

Double rails

Available results



Next steps

Next steps

Further models and model improvements

Scientific publications

Research project

Next steps

Further models and model improvements

Scientific publications

Research project

Provides video footage from rail inspections

Possible real life application

Joint project work

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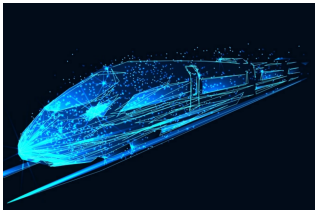
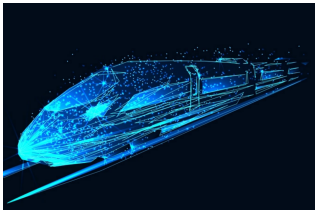


Interest in computer science

AI studies

Motivation



Interest in railway technology

Desire for research

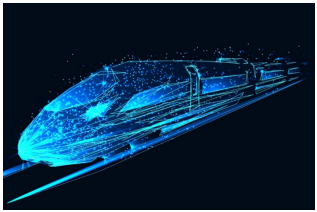
Self education

Scientific workshop

Interest in computer science

AI studies

Motivation



Interest in railway technology

Desire for research

Self education

Scientific workshop

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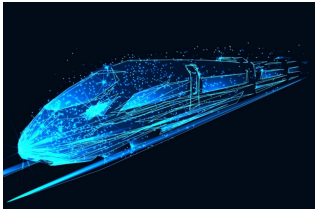
Scientific workshop



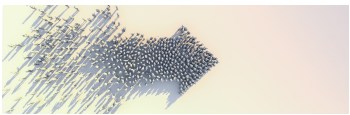
Interest in computer science

AI studies

Research project

(Product development)

Next steps

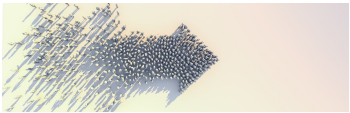


Identify project opportunities

Assess scientific potential

Search for contributors

Next steps



Identify project opportunities

Assess scientific potential

Search for contributors

Proof of concept

- Fit to MÁV CRTI Ltd. equipment
- Limit failure type or location
- Limit input data type (e.g.: no junctions)

Outcome

- Research paper
- Showcase

Department of Highway and Railway Engineering

Role

Center of Competence Railway Engineering

Possible research contributor

Department of Highway and Railway Engineering

Role	Center of Competence Railway Engineering Possible research contributor
Level of contribution	Consultation Literature research Scientific research Student support

Form

Form

'Hobby'-project

Casual consultation

Form

'Hobby'-project	Casual consultation
Informal project	Regular consultation Publications Case studies

Form

'Hobby'-project	Casual consultation
Informal project	Regular consultation Publications Case studies
Contractual form	Regular consultation Publications Case studies Proof of concept, Showcase

Thank you very much for your kind attention!