Railway Inspection with Deep Learning

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Smart Maintenance Conference
03.09.2019
51 Inspectors

250 Defect Types

23’000 defects per Year
Diagnostic Trains

- 160 Km/h
- 18 Cameras
- 10 GB/Km
Diagnostic Trains

- 200 Km/h
- 14 Cameras
- 9 GB/Km
Defect Detection for Railways

Weather
- Rain
- Snow
- Ice

Artefacts
- Dirt
- Leaves
- Chewing gum

Geometry
- Forms
- Shapes
- Switch
Projekt Railcheck
Input Data

Rain
Snow
Dirt
Switch
Street
Processing Pipeline
Anomaly classification

- Welding
- Plastic Particle
- Surface Defect
- Chewing Gum
- Squat
- Wheel Slip
Train and use Neural Network
Agree, that we don’t agree
Fingerprintig

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Defect Evolution

Nov. 16          Feb. 17          April 17          Mai 17          June 17          August 17
ETH Mobilitätsinitiative – OMISM

- The exact time of measurement allows you to combine sensor data from multiple systems.
- It enables correlation between different types of measurement in order to improve system understanding and ultimately performance.
- First such projects are now starting.
- One example is the combination of rail surface defects and acceleration measurements on the axle of the trains.
Improving Predictive Maintenance and System Understanding
Rail under control and shaping the mobility of the future – simple, personal, connected.

Promoting the quality of life and competitive edge of Switzerland and its regions.