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AI Opportunities in Mobility & Transport

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About TT

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EU Horizon 2020 Big Data Value PPP Large Scale Pilot Action

- Goal: demonstrate **transformations big data has on mobility and logistics**
- 47 members - 18.7 MEUR budget - 30 months duration

13 pilots in 7 domains

Available data

160 Data Assets

164TB Data Volume

AI Opportunity (1)
Analytics

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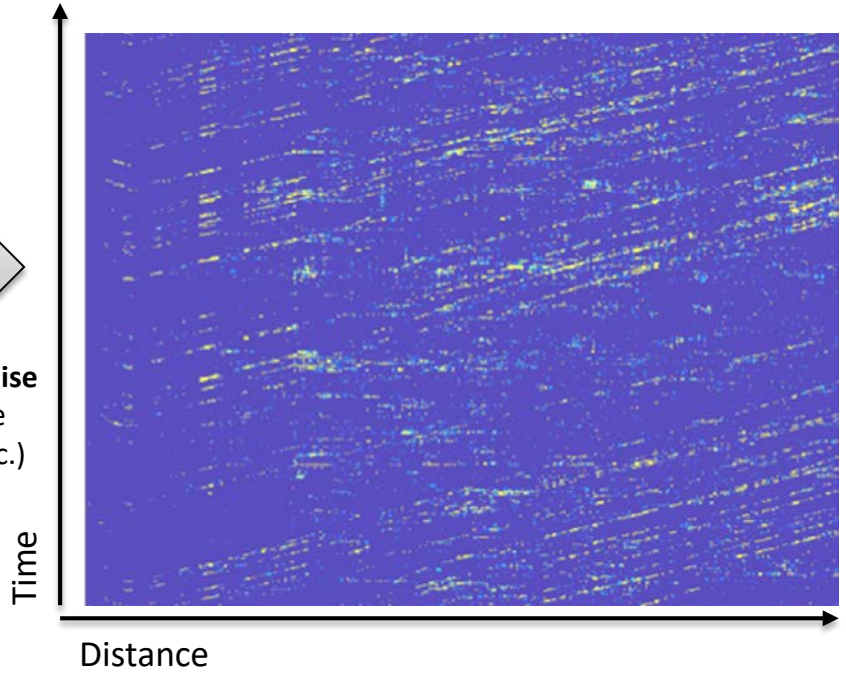
Real-time road incident warnings using novel sensor technology

Optical fiber-based sensor
(0.88 GB/sec)

Isolating Signals from Noise
(classification, adaptive thresholds, clustering etc.)



Filtered data
(1-5 GB/day)

AI Opportunity (1)
Analytics

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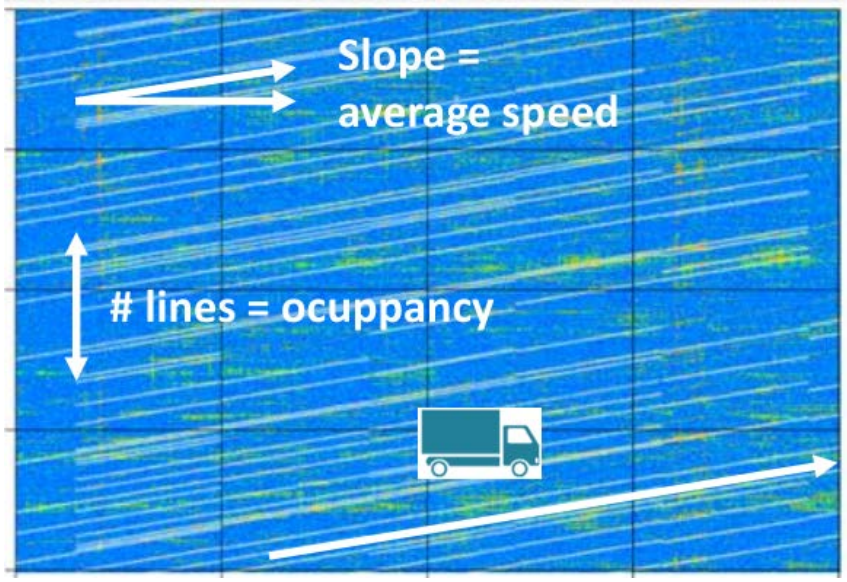
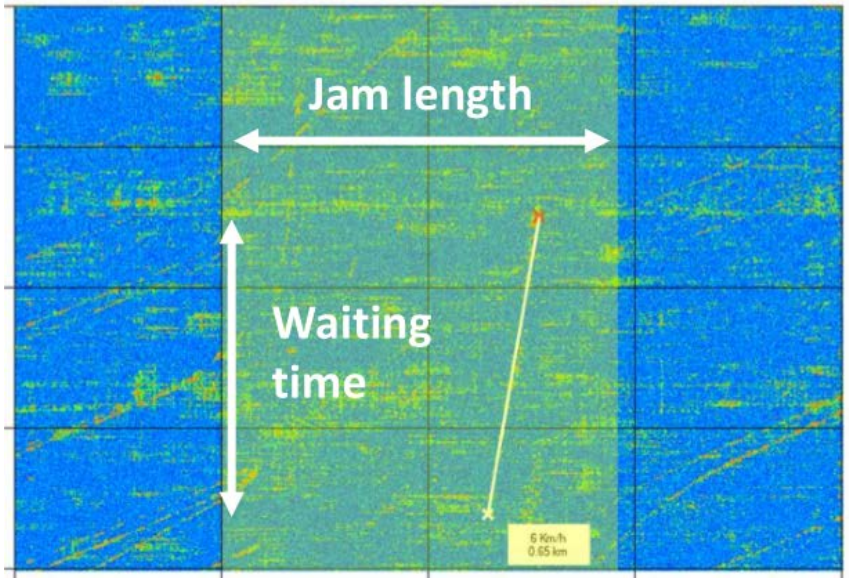
Real-time road incident warnings using novel sensor technology



Individual Mobility Pattern Detection
(trucks)



Aggregate Mobility Pattern Detection
(traffic jams)

AI Opportunity (2)
Prediction

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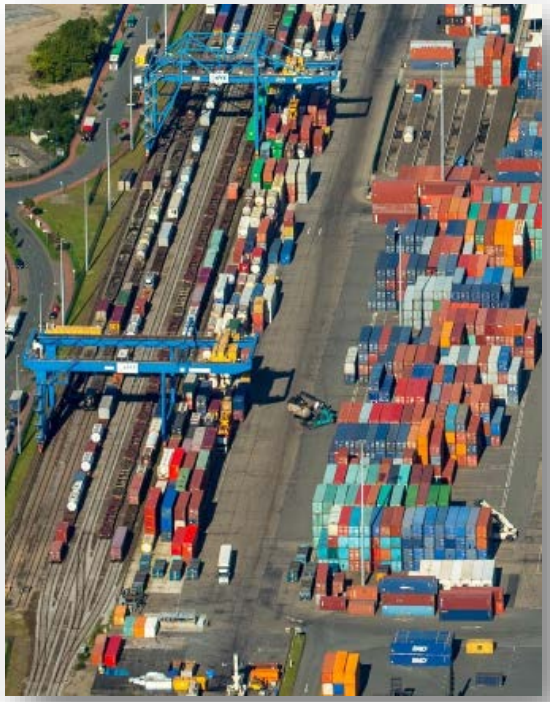
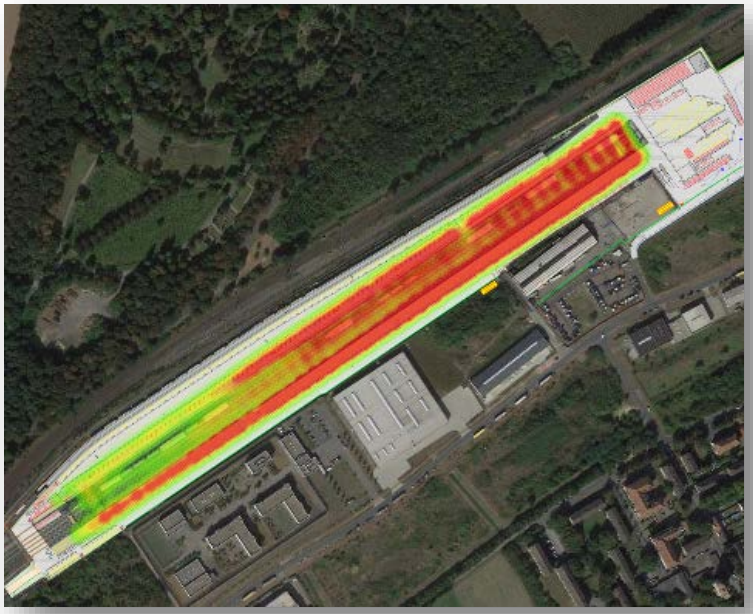
Deep learning for proactive terminal management



Data Integration and Aggregation
(GPS / XYZ mapping; from states to moves)



Data streams from terminal equipment
(1.3 mio states / month)

Integrated data of container moves
(10,000 moves / month)

AI Opportunity (2)
Prediction

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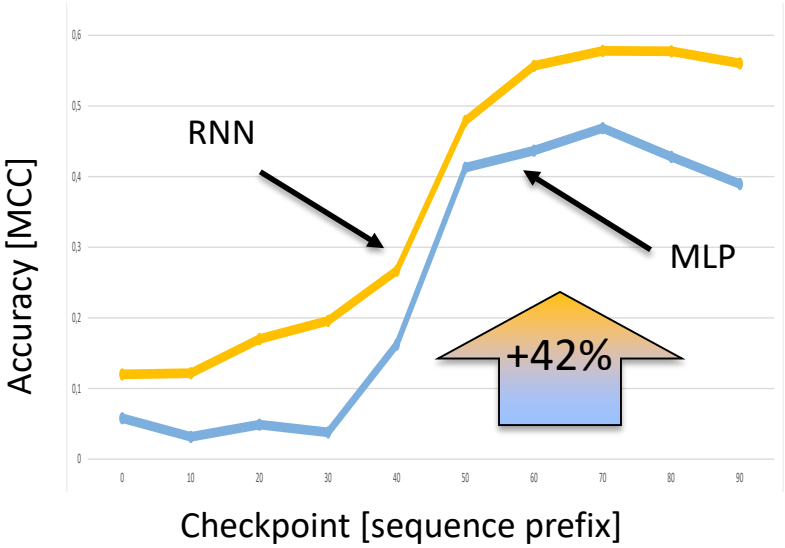
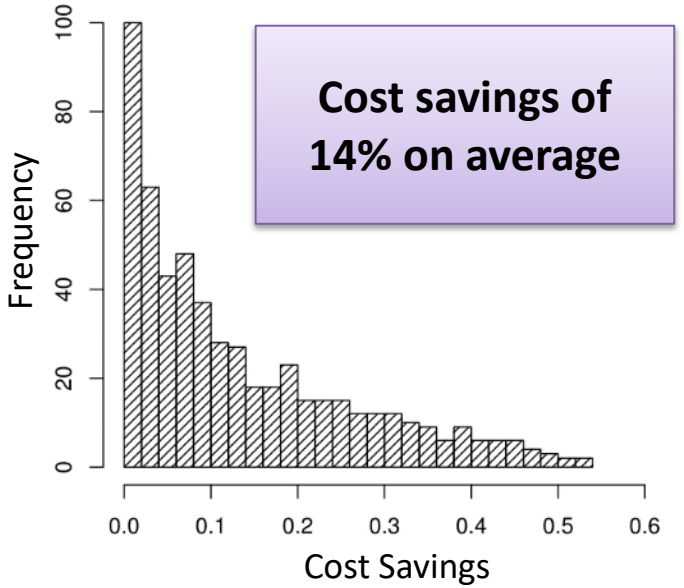
Deep learning for proactive terminal management





Predicting Delays in Container Transport
(Recurrent Neural Networks)

[Metzger & Neubauer, "Considering non-sequential control flows for process prediction with recurrent neural networks", SEAA 2018]

Prediction Reliablity for Decision Support
(Ensemble Neural Networks / Bagging)

[Metzger & Föcker, "Predictive business process monitoring considering reliability estimates", CAiSE 2017]

Conclusion

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Vision of AI in mobility & transport

- **Deep Learning**
  (increased accuracy, automatic feature extraction, …)
- Analytics ✓
  → Prediction ✓
  → (Fully) **Autonomic Decision Making**

Main challenges and/or barriers

- Data sharing considering **protection of commercial data / IPR**
  (ca. 70% of TT data sources, vs. 1% of personal data)
- Integrating AI capabilities **into software systems** (devops, testing, UX, …)
- **"Understandable" AI** (decision support for transport operators/end-users)

Thank You!

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