

Aitonomi



AI Robotics
Smart Road and Smart Track



Experienced Founders

Aitonomi



TRIO

Duesseldorf

Torsten

Co-Founder, CEO
Physicist, IMD MBA

- Serial Tech Entrepreneur
- NASDAQ trade sale exit
- Recognized Innovator
- Patents



Innovation Authority Tower
Riyadh, Since Q4, 2025



KAUST

Makkah Province



Xenia

Co-Founder, COO
International Tech Manager, MA

- 15+ years professional IT experience
- Conceptualization, development & successful implementation of ground-breaking technology innovations
- Tech inventor (patents)



NOI
Bozen

Top Advisors

Aitonomi



Craig Twyford
MD
CCEP Ventures



Harshul Sanghi
Founder & Ex MD
Amex Ventures
Motorola Ventures
WillowTree Ventures



Prof. Dr. Eike Böhm
Ex Daimler Truck
& KION CTO

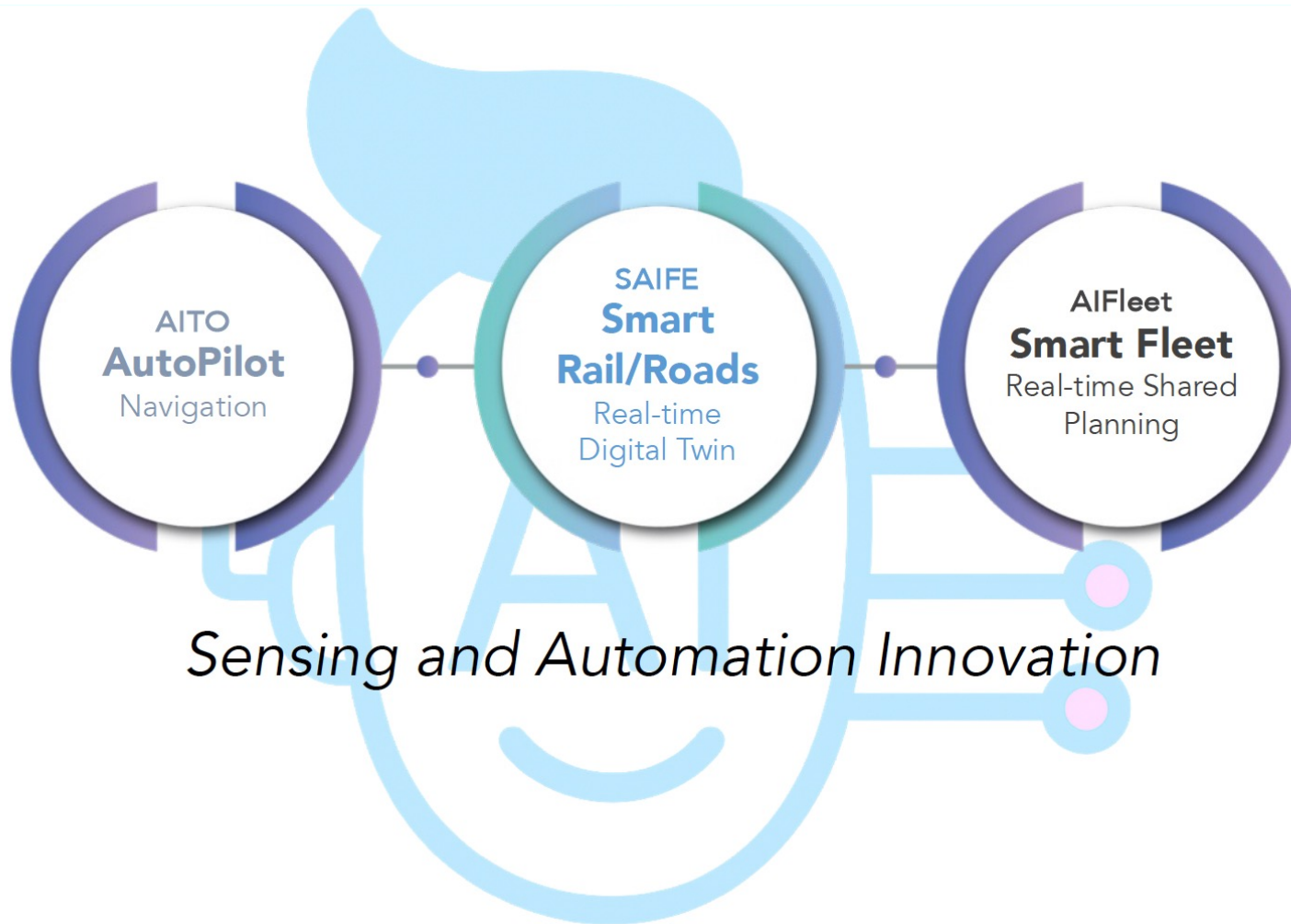


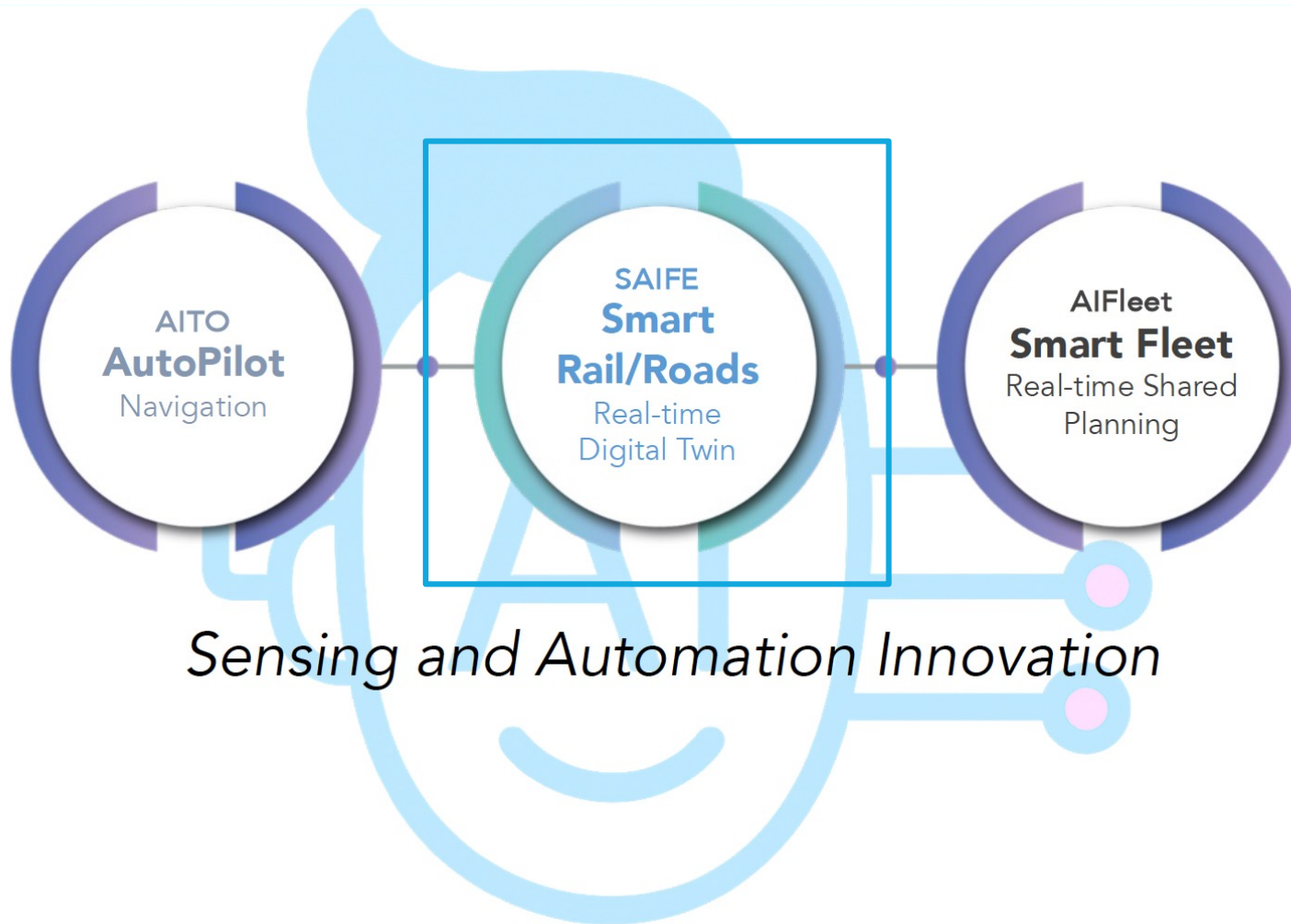
DAIMLER



Prof. Dr. Wolfram Burgard
Leading Roboticist







Fully Autonomous Industrial Transporters

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5G und Digitainability – Was geht in NRW?

06 : 55



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5G SAIFE

Erhöhte Sicherheit für Verkehrsteilnehmer in logistischen Anwendungen durch 5G-Kommunikation und Lokalisierung

Two images are shown side-by-side. The left image shows a red truck on a road. The right image shows a 5G network diagram with a truck icon and a circular signal area.

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Coca-Cola PARTNERS

tu

Ministerium für Wirtschaft, Innovation, Klimaschutz und Energie
des Landes Nordrhein-Westfalen





Warning system for conventional vehicles

- Traffic Detection Sensors
 - Radar (requires power supply, solar cell use can be evaluated)
 - Magnetometer (solar cell use)
- Traffic Warning non-V2X:
 - Automated traffic alert on / by the road for conventional vehicles
 - Alert App for conventional vehicles without V2X
- Traffic Warning V2X:
 - Direct message to vehicles which support V2X
- Road Processing Unit for data analysis and warning issuing
- V2X, 5G NR+ (non-cellular, can be powered with solar cells) as backup for system

Warning system for autonomous vehicles

- Localisation sensor for fog
 - Harmonic Radar for autonomous vehicles
 - Tags (passive, no power supply, no connectivity required) along the road side



Smart Road:

- 5G NR+ (non-cellular) for road infrastructure and traffic participants stand-alone or as **backup**
- Road Sensor Processing Unit for detection and real-time safety alerts (V2X and 5G NR+ as backup)
- Server with AI / Predictions
- Server with Fleet Management for Routing

Backscattering with tags along road:

- Reference tags:
 - receiving frequency 2.9 - 3.1 GHz,
 - transmitting frequency 5.8 - 6.2 GHz
- Harmonic Radar on vehicles



Physical asset on the site



Real-time Digital Twin of that site
to allow Predictive Maintenance



Functionalities to solve the problem

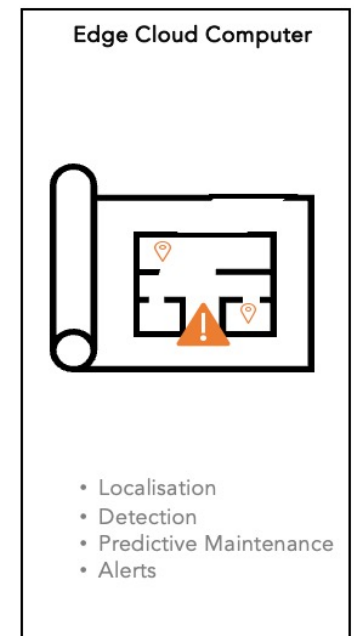
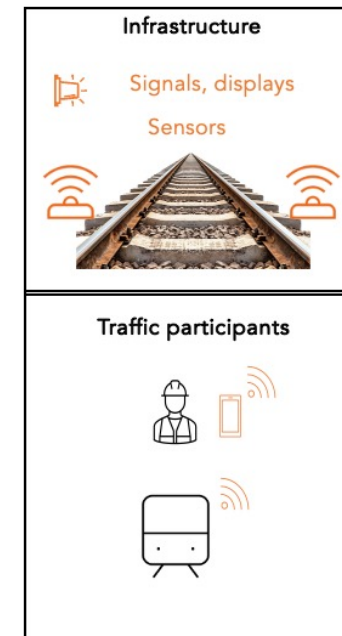
- Enable real-time alerts to the locomotive driver, when locomotive is approaching.
- Enable real-time monitoring of sand collection at sensors and if there is any damage.

Solution to enable functionalities

- Non-cellular network along the track 5G NR+ for reliable low-latency connectivity without SIM cards
 - between track and locomotive
 - between sensors on the track
 - enabled gateway
- Track Sensing
 - Detection
 - Data analysis for predictive maintenance
- User Interface:
 - Alert system for locomotive driver
 - Web Admin for maintenance team

Aitonomi Smart Track: Use Case Example

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Self-healing



Decentralized



License-exempt



Global spectrum



Ultra-low latency



Highly scalable

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